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ABSTRACT

The Joint Federal/State Task Force on Evaluation (the Belmont Group) is currently developing a Joint Comprehensive Evaluation System (JCES) for the federally funded programs under the federal acts listed above. It is planned that JCES will replace the multiplicity of evaluation systems (and paper work) under the separate existing programs. This report covers Phase II of the project and emphasizes a systems analytic viewpoint. One of the distinctive features of JCES is its concern with the evaluation of the management of the funding process, as well as with the impact of the substantive programs being funded. The JCES evaluation model is described in some detail, including goals, objectives, systems elements, and variables. The statistical data sub-systems, including the instruments to be used, are characterized and analyzed. The system reporting requirements are discussed and specified. The data analysis plan requirements are outlined. JCES implementation schedules, working organization, and manpower requirements are noted. Political and practical implementation problems are discussed. The sampling designs to be used are described in detail. Finally, brief discussions of the requirements for the further development of the total JCES are included. The appendices to this report are available as TM 000 108. [Page 54 is blank and omitted.] (DG)

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Scientific Educational Systems, Inc.
SUITE 607
910 17TH STREET, N.W.
WASHINGTON, D. C. 20006
202 833-8028

DRAFT

JOINT FEDERAL/STATE TASK FORCE ON EVALUATION

COMPREHENSIVE EVALUATION SYSTEM

CURRENT STATUS AND DEVELOPMENT REQUIREMENTS

PREPARED FOR

THE JOINT FEDERAL/STATE TASK FORCE ON EVALUATION

AND SUBMITTED TO

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WASHINGTON, D. C.

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SCIENTIFIC EDUCATIONAL SYSTEMS, INC.

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FOREWORD

This report covers Phase II in a continuing effort to develop a comprehensive review and critical examination of the Comprehensive Evaluation System being developed by The Joint Federal/State Task Force on Evaluation. The first (Phase I) report was primarily descriptive of the various aspects and purposes of the JCES as of that date (22 November 1969). It attempted to review the JCES in some detail, but provided only the beginnings of integrative and critical comment.

The present document presents a more refined view of the JCES, emphasizing a systems analytic viewpoint. Since the system is constantly evolving, it has been necessary to bring the review up to date to describe the system as it is envisioned as of the present time. The current system description and review incorporates many of the analytic data and conclusions derived from ongoing analytic studies. This is especially true in the areas of evaluation concepts, systems concepts and data analysis and reporting requirements.

Inclusion of these data has yielded a much more comprehensive view of the JCES and its future developmental requirements than was possible during Phase I of the study.

In future phases of this work, it is expected that the systems concepts, and the reporting and data analysis plans will be fully developed.

SES wishes to express its appreciation for the help of many of the USOE Staff in the collection of data pertinent to the preparation of this document.

INTRODUCTION

The last two decades have witnessed increasing concern with the effectiveness and efficiency of the American educational process. This growing concern has led naturally to the growth and development of Federal funding programs designed to support and augment various educational endeavors on the state and local levels. In the wake of these funding programs (particularly since the Elementary and Secondary Education Act of 1965) there has come increasing concern that these support programs actually accomplish the objective of improving American Education (however this may be defined). Therefore, more and more attention has been paid to the principle of accountability in the expenditure of Federal funds, and to the "evaluation" of Federal support programs.

There have of course been many responses to the pressure to evaluate. One of the most significant ones has been the recent establishment of the Joint Federal/State Task Force on Evaluation consisting of representatives of the U.S. Office of Education and of the Chief State School Officers of 20 of the States. This Task Force (sometimes called the Belmont Group after the place where the organizational meeting was held) signed an Agreement* under which it is attempting to develop a Joint Comprehensive Evaluation System (JCES) through which to meet the increasing demands for evaluation in connection with Federal/State funding programs in education. It is the nature and characteristics of this JCES with which the present study is concerned.

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* The Belmont agreement is shown as Appendix A to this report and the twenty Belmont States are listed as Appendix B

It is important to recognize at the outset that one of the distinctive features of the JCES is its concern with the evaluation of the (management of the) funding process, as well as with the impacts of the substantive programs being funded. That this dual concern is essential becomes obvious when the nature of the Federal support system is analyzed. It can readily be seen that to a very large degree, the Federal support system is a "delivery system" designed to transmit the funds appropriated by Congress to State and local levels where they are translated into educational programs. Thus, the JCES must in large measure consider the adequacy of the funding process, and its management, as well as the impact of the consequent educational programs on schools, teachers, pupils, etc. Furthermore, it is in this respect that the JCES becomes a valuable management tool, as well as an assessment system, for it is well-known that good management demands a constant flow of feedback information regarding the effect and impact of current management practices.

With the above background, and full appreciation of the importance assigned to "management" in the JCES concept, it is appropriate to discuss in more detail below the basic concepts, needs, and purposes underlying the development of the JCES.

As the JCES is particularly concerned with evaluation as it relates to management, a goodly portion of the discussion centers on defining the relationships between the JCES and management considerations.

In a sense, development of the JCES can be viewed as an extension of the normal management review and evaluation practices necessary to the efficient management and control of large organizations and distribution chains. Everyday good management practice demands that the managers at each level be informed of both the effectiveness of their own staff procedures and the effects that their actions may have on the end products of the organization. The development of the JCES is in reality the refinement and redesign of a set of existing evaluation requirements originally derived from legislation. These early requirements had been developed in haste at the beginnings of Federal support to educational development, and subsequent events have shown them to be not entirely adequate to the management review task. Thus, the development of the JCES should be considered an experimental development of a needed management tool, particularly with respect to the evaluation of the funding processes and of the effects of these processes on the target groups.

This view of evaluation is based on the recognition that management consists primarily of two major functions: planning and execution, but that each functional act of the manager must be based on his knowledge of the results of his prior planning and execution and its success or failure. In this light, the evaluation of effect is a necessary step to provide feedback to managers about the adequacy of their decisions, plans and acts.

Some Problems and Needs

The recent proliferation of Federal funding for educational programs at State and Local Levels has resulted in a rather unwieldy management system across the three levels of management responsibility. It has also led to a recognized, but generally unsatisfied, need for an adequate evaluation methodology to assess the processes and products of the various educational programs developed. Each of the Federal Acts and Titles authorizing either general or special funds for educational support has also called for either periodic or continuous evaluation of the resulting Programs. While legal requirements for evaluation and reporting are usually not specific, they are at least implicit in all Titles. The implementation of these educational grant Programs and the development of substantive programs in States and Local agencies has frequently been done hurriedly. Developers were usually operating under time constraints which imposed expedient rather than optimal management and evaluation procedures for this installation.

This may be illustrated by the vertical (by Program or Title) management structures which developed within USOE and were soon paralleled in most of the State and local agencies. Such vertical structuring of the organizational components of an agency can be very efficient for getting something done, such as the rapid dispensation of large sums of money in this case. But it can also result in a large degree of overlap, with parallel personnel performing the same functions and handling the same or similar information and data; frequently, the counterpart persons may not even be aware of the duplication.

Such duplication has apparently occurred throughout the Federal/State/Local management chain, at least to the extent that many separate Programs and their (sometimes) redundant personnel are required to report highly similar information to higher levels in the form of program-related, fiscal, or other reports. This is best illustrated by the current requirement for approximately 123 separate statistical reports imposed on the State and Local agencies reporting on the various Programs. The exact degree of content redundancy is unknown but the overlap of report titles would indicate considerable content overlap, also. Regardless of actual content redundancy, the multiple requirements pose a heavy burden for clerical and managerial personnel at all levels in the management chain.

Multiple reporting has posed other problems also. It has resulted in some lacks of cross-program information required for efficient management of the overall Funding and Program development process. For example, precise information is lacking from many Programs and agencies in three specific areas crucial to effective Program management:

1) What are the specific needs for support in State and Local areas?

2) What is the amount of money required? and;
3) What educational projects and programs work best under which conditions?

These data are frequently lacking at all three major management levels and this lack is likely to be as detrimental at the local agency level as at the Federal level.

The Joint Comprehensive Evaluation System is directed toward meeting these information needs and evaluative requirements at all three levels. Further, the system is intended to provide a vehicle for obtaining project/pupil oriented data, as well as management oriented data. This will allow an adequate basis for evaluation of both the processes of the Federal/State/Local "delivery system" for educational support, and the products of the Projects instituted through the Federal/State support programs.

Purposes of the JCES

There are three related, broad purposes being supported by the JCES development. These are:

1) To consolidate and reduce the proliferation of statistical and evaluative reports which have been generated under current requirements;
2) To develop a more management-oriented evaluation capability, together with a product-oriented evaluation capability, to permit more effective program planning and more efficient management of Program Funding disbursement and Substantive Program planning; and,
3) To develop and disseminate materials and techniques for study and training related to local staff development to assist in high quality, consistent, local evaluation efforts.

JCES Benefits

The current evaluation system development is unique in that it may be the first time that parties from Federal and State levels have joined together to examine(and to do something about) the problems surrounding the management of disbursement of Federal funds. Here, for the first time, State personnel are becoming involved in defining the processes whereby both the needs of their States and the effects of programs within their States are to be assessed. This joint effort provides the States the opportunity to participate to some degree in the Federal planning and simultaneously should provide them a better view of the true extent of needs for both specific funding supports and for management improvements within the Federal/State/Local allocation and disbursement system.

In addition the implementation of the JCES should result in a number of more tangible benefits for Local, State and Federal agencies. The System implementation should:

1) provide a better assessment of the needs of pupils, schools, Districts and States;
2) provide a better capability for the estimation of the Program strategies necessary to meet these defined needs;
3) provide indications of the levels of funding required to implement the strategies;
4) provide some indication of the mix of funds (by mandated uses)
5) improve grants management at both Federal and State agency levels;

6) aid determination of the nature and extent of technical assistance required at the local levels; and
7) increase the focus on training requirements for evaluators and program managers at the State and Local levels.

Thus the JCES implementation should become an important management tool for Agency Managers, Program Managers and Grants Managers at each management level through provision of a capability for near-continuous monitoring of the grants management and program developments. This monitoring and the proposed direct feedback to all consumers can provide Federal, State, and local administrators with up-to-date, program-relevent, assessments of program processes and the sequential progress that results.

THE JOINT COMPREHENSIVE EVALUATION SYSTEM

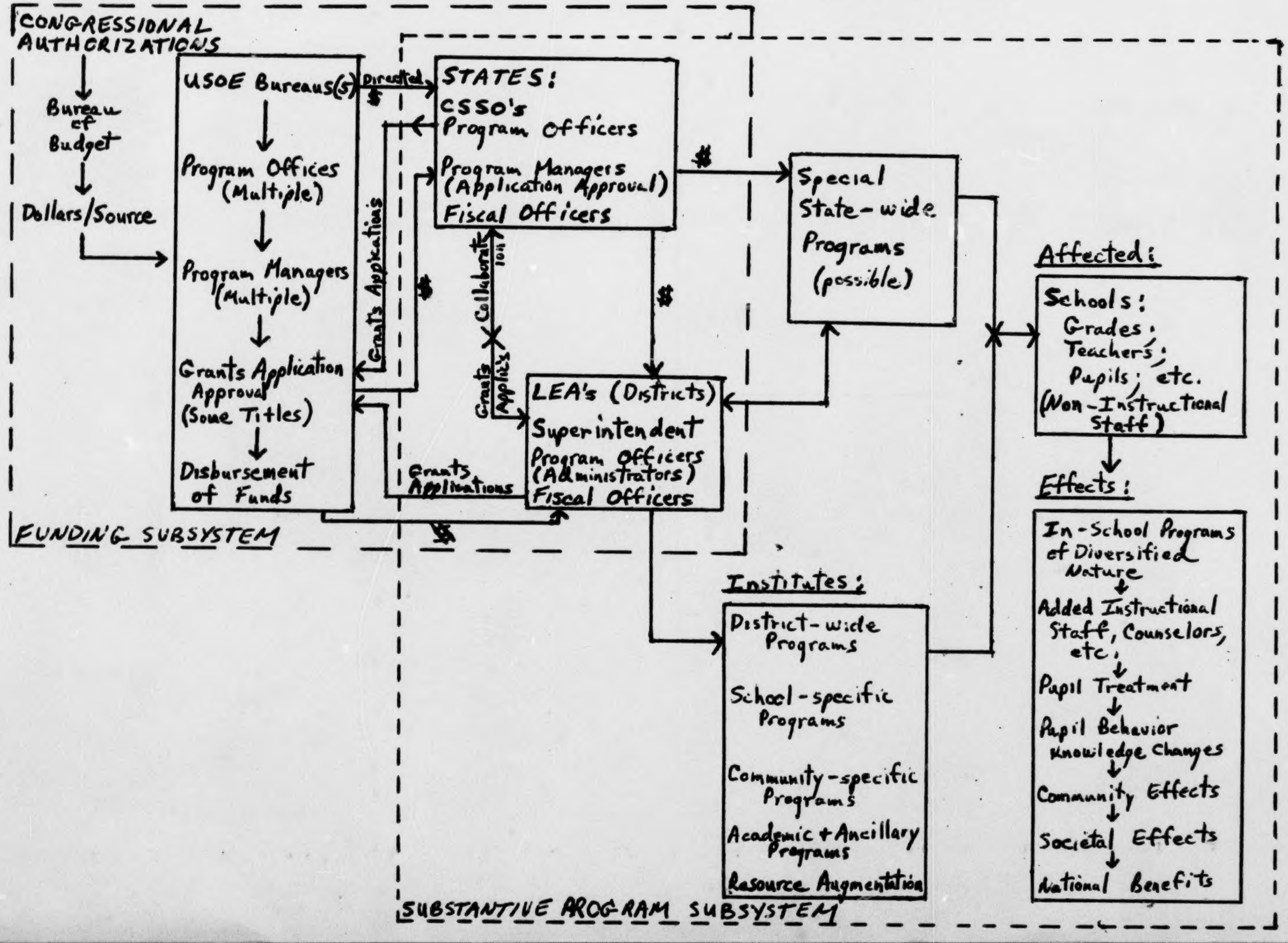
This section presents a description of the development and the current status of the JCES and its elements. The first part of this section formulates an important distinction which appears necessary to the discussion of the JCES. This is the identification of the operating "Delivery System" and its discrimination from the developing evaluation system. While the evaluation system will be a tool for the management portions of the Delivery System, the "Delivery System" itself is the overall system concerned with the transmittal of funds from funding sources through to substantive programs. A description of the Delivery System, and its operating objectives and goals is presented below. This description is done at a quite gross level but should provide sufficient clarification for the discussion of the evaluation system development.

The Delivery System

The Federal/State/Local Delivery System for funds distribution and translation of dollars into substantive projects is illustrated in Exhibit 1. This diagram sketches the relationships between the several management levels in the flow of dollars through the Funding Subsystem into and through the Substantive Subsystem to achieve an impact on the schools, teachers, and pupils. The Funding Subsystem may be considered to be almost entriely a fiscal management chain, which deals with the problems of grants applications, approvals, dollars, and fiscal account-

EXHIBIT 1

THE USOE/SEA/LEA DELIVERY SYSTEM


CONGRESSIONAL AUTHORIZATIONS
Bureau of Budget
Dollars/Source
USOE Bureaus(s)
Program Offices (Multiple)
Program Managers (Multiple)
Grants Application Approval (Some Titles)
Disbursement of Funds
FUNDING SUBSYSTEM
Directed $
Grants Applications
$
Grants Applications
$
STATES:
CSSO's
Program Officers
Program Managers (Application Approval)
Fiscal Officers
Collaborati(on)
Grants Applicat(ions)
$
$
Special State-wide Programs (possible)
LEA's (Districts)
Superintendent
Program Officers (Administrators)
Fiscal Officers
Institutes:
District-wide Programs
School-specific Programs
Community-specific Programs
Academic + Ancillary Programs
Resource Augmentation
Affected:
Schools:
Grades;
Teachers;
Pupils; etc.
(Non-Instructional Staff)
Effects:
In-School Programs of Diversified Nature
Added Instructional Staff, Counselors, etc.
Pupil Treatment
Pupil Behavior Knowledge Changes
Community Effects
Societal Effects
National Benefits
SUBSTANTIVE PROGRAM SUBSYSTEM

ability. This management chain operates at each level according to predefined rules to pass down the Federal monies and to fund specific programs or projects in either State or Local or school end-points. Some funds also go toward augmentation of on-going activities, so not all funding is related to establishment of new projects in schools.

The Substantive Subsystem is concerned with the type and level of activities which are needed, or are to be activated with the funds received, at the State, District, or school levels. Persons in this subsystem must be capable of defining and developing educational programs, curricula, and activities, and should be capable of performing the evaluative tasks necessary to assess their success or failure. This subsystem may be thought of as functionally separate from the Funding subsystem; however, the personnel performing the two sets of functions at many levels are the same persons or at least the same types. Frequently there is another type of overlap, in that the functions required of one person may simultaneously affect both subsystems. Conceptually, however, these are two distinct subsystems of the Delivery System, and, on the basis of the differences in skills apparently required for fiscal and for educational decisions, it would appear most desirable for different persons to operate in the two systematic functions most of the time.

An important concept for evaluation inherent in this distinction is that either of these two subsystems could conceivably be operating with a high degree of efficiency (within some constraints) even if the other subsystem were not functioning well at all. That is to say, while the Substantive Program subsystem could certainly be limited in innovative or augmented program development without funding, it might still accomplish its functions even if the funding management were operating inefficiently. Similarly, the Funding distribution subsystem could be operating smoothly and efficiently within a State and Local chain, but the conversion of funds to substantive programs could be quite inefficient and ineffective at the same time.

This major distinction is drawn to underscore the importance of process measures of the systems operation in addition to the product measures associated with student changes. Without the process type of measures, such as those related to the efficiency of operation of the Funding Subsystem, erroneous conclusions could be drawn from product measures like Pupil achievement scores alone. Process measures allow one to examine the how and why of a successful or unsuccessful program as well as simply the what happened, indicated by the terminal results. This is especially important in view of the partial interdependence of the subsystems in the Delivery System to be evaluated here. (The implications of the distinctions between process and product evaluation will be fully developed as a part of Phase III of the current effort.)

The JCES Goals and Development Approach

Development of systematic evaluation procedures, instruments, and techniques to assess the effectiveness of the Delivery System described above requires detailed consideration of both the Delivery System goals and objectives, and the basic objectives of the JCES itself. That is, the Delivery System is designed to perform certain functions at some desired level of adequacy and these can be thought of as the system goals or objectives. Similarly, the evaluation system is designed to answer certain defined questions about the system performance and to report these answers to designated users; these can be thought of as the JCES objectives. The development of goals is considered below. Additional developmental considerations persented in this section include, the developmental approaches to be applied, and the basic evaluation model which describes the JCES development.

Delivery System Goals

Prior to evaluation of any system the goals or objectives of that system must be specified in sufficient detail to allow development of criteria or this step has not yet been completed for the Federal/State/Local Delivery System, and the development of these criteria will require a somewhat lengthly and detailed process of defining system and program objectives in measureable terms. For the moment, the general legislative goals must be accepted as sufficient goal statements. These statements reduce to a set of requirements imposed on the management structure of the Delivery System that demand the production of "good" results (better educational opportunities, and more effective educational programs for the educationally deprived, whether these persons are disadvantaged, socially deprived, or otherwise partially incapacitated in their freedom to achieve a "good" education.) The legislative goals could be stated at much greater length, but they boil down to about the above statement and, as is readily observable, are not of much help in defining precise goals and objectives for the Delivery System's operations. These require much more precise and detailed specification prior to the eventual evaluation of the performance of the system. Such a specification can and must be done early in the subsequent development. It is only against such definitive objective statements for the system that its actual effectiveness and efficiency may be justly evaluated. This specification is expecially critical for the management aspects of the Delivery System, since this part of the system is the least definable in terms of performance objectives.

JCES Objectives

The evaluation purposes of the Joint Task Force are to assess, and to relate to intended utilization, the effects of the various Funding and Substantive Programs resultant from the various legislative Acts and Titles with which the JCES is to be concerned (See Exhibit 2). The evaluation system will not evaluate the adequacy of the legislation *per se*,

EXHIBIT 2

Listing of the Legislative Acts and Titles of Programs to be evaluated under the JCES*

1. ESEA Title I:
    - a. Low Income Groups
    - b. Neglected and Delinquent Children
    - c. Migrants
2. ESEA Titles II
3. ESEA Title III
4. ESEA Title V, Section 503 - Flow Through Funds
5. ESEA Title VII
6. ESEA Title VIII
7. NDEA Title III
8. NDEA Title V-A.
9. Civil Rights Act, Title IV
10. **Follow-Through**

The above Acts and Titles fund Programs which are under the supervision of the Bureaus of Elementary and Secondary Education and of Adult, Vocational and Technical Education.

The Vocational Education Amendments Act may be added to the set of Titles/ Programs to be evaluated at a later date.

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* Appendix C presents a detailed review of the evaluation requirements and authorizations of each of these Legislative Acts and Titles.

although such might result, serendipitously, from the evaluation of effects. Rather, the system must provide for appropriate inputs to legislative and administrative thinking through reports of progress and effectiveness as well as of needs still unsatisfied by current programs. Thus, the evalution is directed at the effects of the legislation, and toward possible modification, but not at the legislation, itself.

Effects of legislation and the delivery of funds to States and local agencies are comprised of several types. Among these are:

1) Specific, unique, and novel management requirements laid on the Federal, State and local agencies, requiring additional expenditures of time, manpower (perhaps uniquely unavailable skills), and Federal funds for administrative chores, or overhead tasks.

2) Specific substantive program developments instituted within local agencies, schools and classrooms - these have specific effects on the individual pupils and on the total classes, which may be on academic skills, social development, or other student characteristics.

3) Other non-specific effects of the dollar inputs to local agencies which may or may not be reflected in specific programs directly affecting the individual children in the school area.

Other individual types of effects could be identified but these seem to be representative of both the complexity of the problem and the two general types of effects: Management effects, or Process-related effects of

Programs; and, Pupil/project effects in schools and districts, or Product-related effects. The evaluation must be able to deal with these two types of effects of Programs wherever they may occur.

On the basis of the above, the goals of the Joint Comprehensive Evaluation System are to provide the capability for accurate assessment of school and pupil educational achievement; to evaluate the differential effectiveness of the various Federally funded Programs on the basis of the educational and related results of the projects instituted; and to evaluate the process of funds distribution through the Delivery System. The planned evaluation system will provide this capability for multiple effectiveness evaluation and will directly assess the results of the diverse projects, activities and treatments in the schools of the Nation.

The evaluation system will also investigate the degree to which various needs of the students, local agencies and schools, are being met through current Federal contributions in conjunction with the local and State financing. This goal includes identification and assessment of the needs not being met as well as of the degree to which current programs are effective for recognized needs.

The goals of the JCES may be restated as the following objectives, toward which the instrument development and the planned implementation are directed (Note that the descriptive material is relevant to the evaluation of process, as well as background for product evaluation):

1) Describe individual school characteristics and pupil characteristics at the school level;
2) Describe the projects, activities, or treatments in which pupils are participating at the school level;
3) Relate school and pupil characteristics to specific projects, activities and treatments;
4) Describe overall Program progress;
5) Identify successful projects, activities or treatments; and,
6) Assess needs in terms of:

   a) flow of services, b) populations being served, c) projects, activities, or treatments not being provided, and d) pupil changes not occurring.

In order to assess the attainment of these goals, the components of the JCES must collect the necessary data. In an effort to determine whether or not this data will be collected a set of first level evaluation questions has been identified. These questions will be compared against the various system components to determine if all the required information has been considered. The evaluation questions themselves have been abstracted from a set of policy questions provided by OE and represent the types of questions asked by OE program managers. (For measurement purpose such questions must be refined. A beginning and further discussion are given in Appendix D. The evaluation questions are:

1. What are the background characteristics of the general student population at the school, district and state level?
2. What are the background characteristics of the students who participate in OE programs and of those who should participate and don't?
3. What are the characteristics of the schools and school facilities that participate and that do not participate in the O.E. program?
4. What types of School personnel - from administrator to teacher - participate in O.E. programs?
5. What are the various types of general services provided to the school, school personnel and students?
6. How are the various programs administered at the state, district and local levels?
7. What are the costs of these programs and what are the various sources of funds available to cover them?
8. What are the special programs with services directed at well defined target groups or selected populations?
9. How effective are these programs in meeting the needs of the groups they are intended to serve?
10. What are the identifiable benefits from these programs to the school, school personnel and students?

11. What is the extent and results of program research and development activity?
12. How do the schools interact with the community and local government agencies to solve community problems?

It should be remembered that these evaluation questions are offered at this time as being representative but not exhaustive of those which might be asked, cutting across specific programs, and emphasizing the kinds of questions which may be asked of the JCES in the future.

Basic Developmental Approach

The basic approach taken in the development and implementation of the JCES is founded on two major points: *

1) Obtaining close cooperation of the States, and thereby the Districts, through a joint development effort directed toward providing evaluation and lessened workload payoffs to both the States and Districts,

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* Certain practical and political considerations have influenced the approach taken in the development of the JCES. These included a variety of items which might be construed to be obstacles or hindrances to the development and installation of any comprehensive evaluation system - particularly were such a system to impose new work loads on the contributing agencies in the States and Districts. They also include a number of legal and internal regulations which tended to restrict the time limits for application and completion of the evaluation system. These considerations are discussed later in this report.

as well as to the USOE; and,

2) Designing and developing the data collection subsystem so as to consolidate and reduce the existing evaluation reporting requirements of local agencies, by emphasizing the interventions of existing data-streams and minimizing the requirements for new information from these agencies.

The first point above led to the development of a Joint Federal/ State Task Force (the Belmont Group) under a cooperative working agreement directed toward the development of a comprehensive and consolidated evaluation system. Such a Joint group appeared to be the optimal foundation for the development of a comprehensive evaluation system fully responsive to the needs of both Federal and State and local evaluation interests. Furthermore, such a working group was deemed highly desirable from the view of effectiveness in attaining both the cooperation and the information essential to the successful development of the JCES.

The second point dictated a review of all existing data streams and other locally available data to evaluate the suitability of these data for the overall comprehensive evaluation purposes. Some of the current data sources available (or replacement) by the JCES are listed in Exhibit 3. These data sources, expecially the multiple, separate ones related to individual Funding Program evaluation based on currently mandated reporting requirements, proved to be highly redundant. Thus, the

EXHIBIT 3

Some current Data Sources available for Conversion or Replacement under the JCES.

1. Grants Applications Forms
2. Project Evaluation Reports
3. Fiscal Reports
4. Statistical Reports
5. Program Evaluation Reports
6. National Evaluation Studies
    a. ESEA Title I
    b. ESEA Title II
    c. NDEA Title III
    d. NDES Title V—A.
7. Educational Audits
8. Progress Reports

major effort was defined as the specification and selection of those data streams which could be successfully intervened for the purposes of the comprehensive evaluation of all Federal programs and the necessary modification of the instruments, etc., related to each data stream, to meet the precise needs of the JCES.

The formation of a joint group to define and implement the JCES is believed likely to be highly effective in reducing many of the State and local problems previously encountered in Federal evaluation efforts. Since State and local agencies participate in the design and implementation planning of the effort, this joint group also has advantages for the States, etc., since evaluation data will be rapidly fed back to the local agencies to aid them in their management and educational program development functions. It is anticipated that the joint effort will result in considerable payoff to all concerned in terms of reduced workloads, reduced external reporting requirements, and more accurate and more comprehensive evaluation of both management and educational activities at all levels of the Delivery System's operations.

Evaluation Models

A major function of the developing JCES is to evaluate the effectiveness of the various Federally sponsored programs which have been introduced into the school environment. As with most evaluation schemes, this system is based on the observation and assessment of changes in the target populations over time and the evaluation of the programs on this basis. This is essentially a longitudinal change model for evaluation and is based partially on the assumption that the treatments (programs and activities) intorduced will, if they are effective, produce a set of desirable, objectively measureable, changes in the target populations. Such as an assumption is the basis of all change study evaluations.

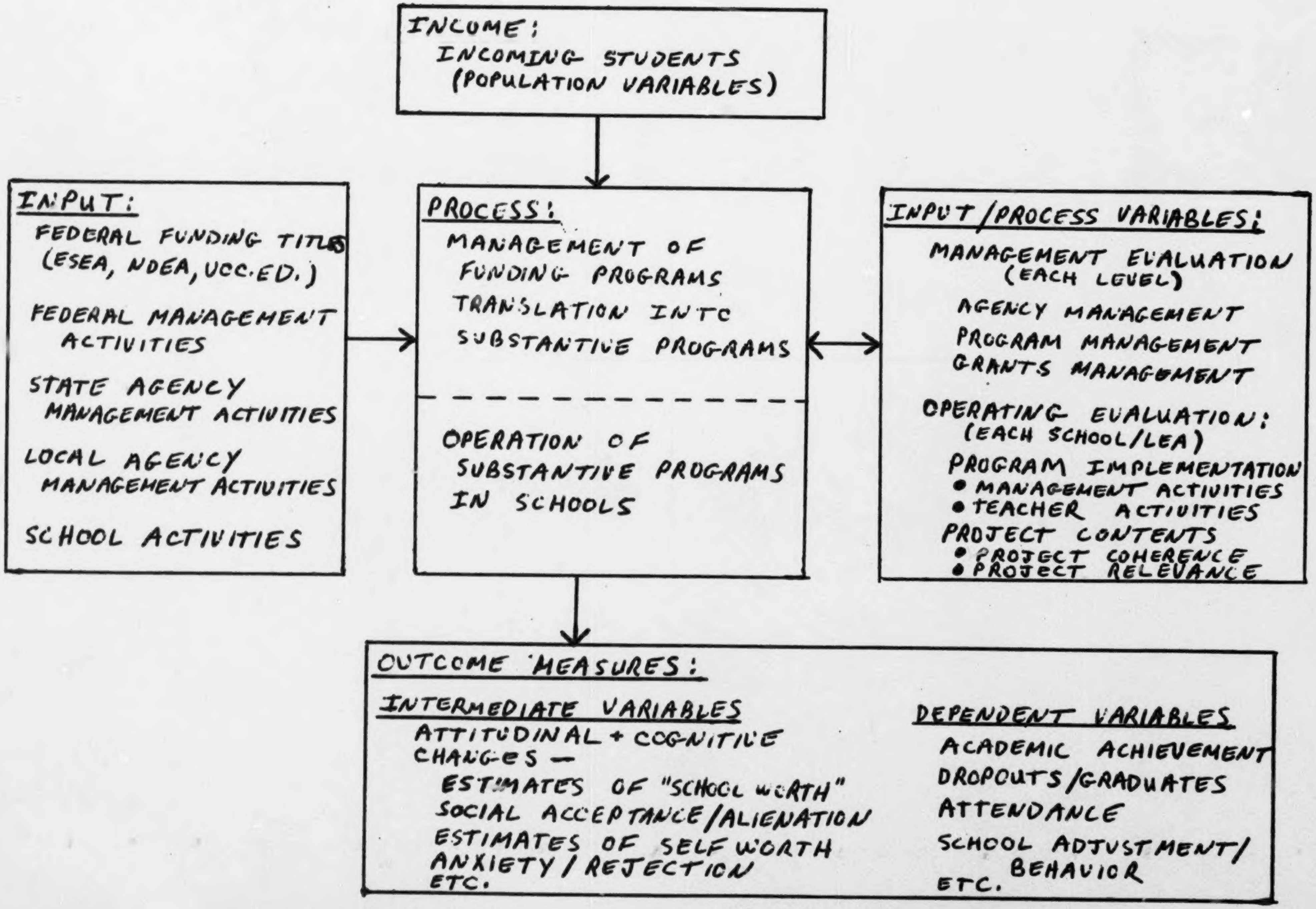
An additional dimension of evaluation is required, however, centering on the management aspect of the Federal Programs and their implementation within the States and Localities. This evaluation requirement derives from the necessity for all managers at all levels to be informed about the adequacy of their own operations in order to modify them toward improved functioning. This, requires evaluative data collection, analysis and feedback of data and reports to Agency Managers, Program Administrators and Grants Managers at all involved levels.

The same longitudinal change model postulated above as necessary for substantive program evaluation can be used to assess management functions also through the direct incorporation of process variable measurement and feedback to the concerned managers. However, evaluation of the adequacy of performance of these managerial functions requires the development of specific standards or criteria for such task performances, and these are mostly still lacking within the operating system. Therefore, such criterion development must be a part of the evolution of the comprehensive system. It appears that such criterion development should be undertaken by the combined forces of the Federal/State/local agencies and personnel who would be most affected by their application. Certainly, these criteria must be both performance oriented and pragmatically sound in relation to the specific management tasks and functions performed.

Exhibit 4 presents an illustration of the goal model approach to evaluation in this context. This approach characterizes the funding and substantive program development and management as the overall Input and Process activities within a measurement paradigm designed to identify the adequacy of performance of these activities on the basis of relationships between specified Process and Outcome (dependent) variables. The approach assumes the definition of the specific process variables associated with a given Program developement and implementation (including its management) and the capability for associating measures of these with criteria for their performance and also with the Outcome variables. The Outcome variables msut also be specified and related criterion values in order for the goal model approach to be fully effective in assessment of the values or benefits derived from a given program activity. For individual programs and for comparisons between Programs, the appropriate analysis and evaluation of the variables suggested by this paradigm and the changes in each set over time, through a sequential

EXHIBIT 4

MODIFIED GOAL MODEL EVALUATION PARADIGM

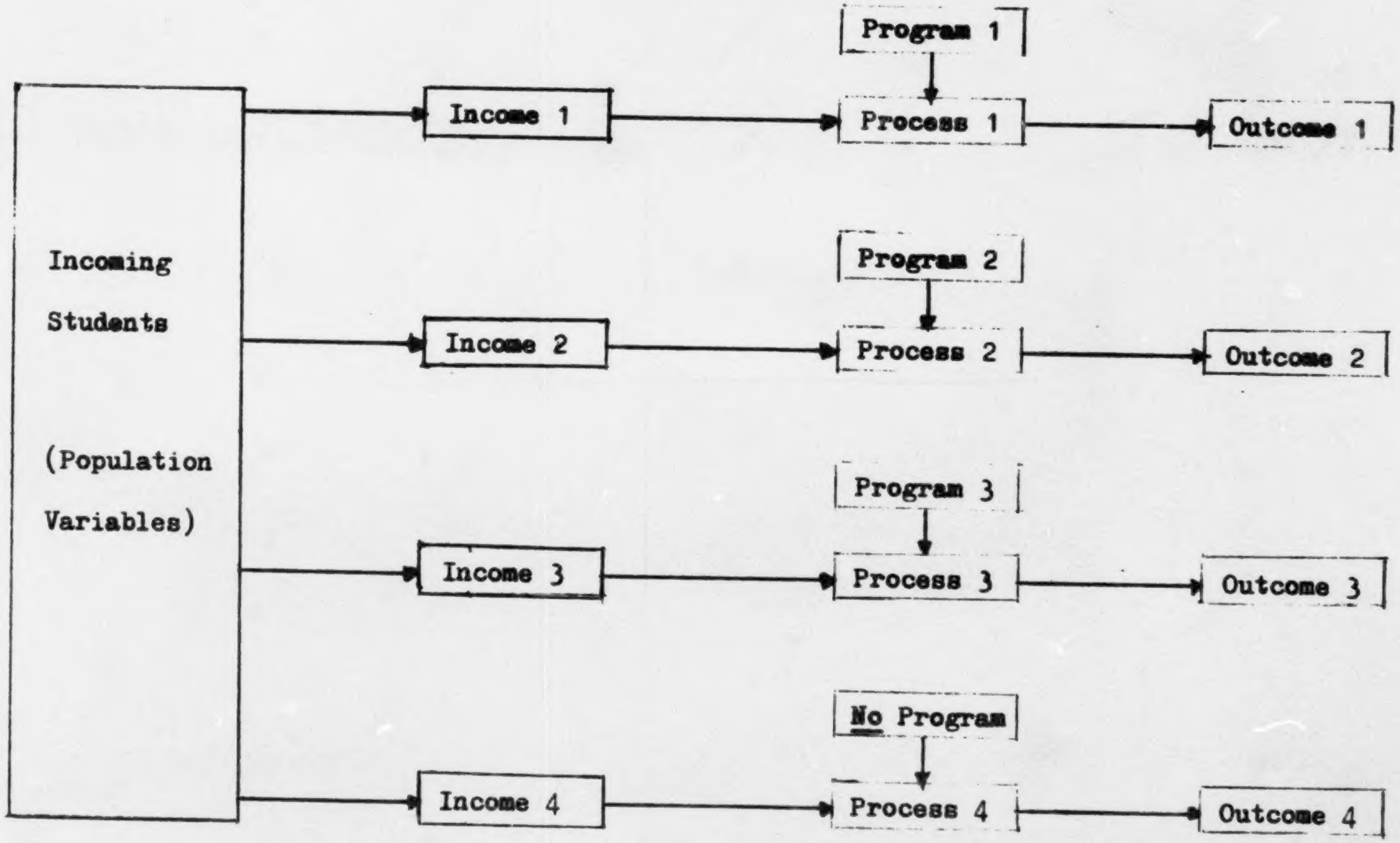

INCOME:
INCOMING STUDENTS
(POPULATION VARIABLES)
INPUT:
FEDERAL FUNDING TITLES
(ESEA, NDEA, VOC.ED.)
FEDERAL MANAGEMENT ACTIVITIES
STATE AGENCY MANAGEMENT ACTIVITIES
LOCAL AGENCY MANAGEMENT ACTIVITIES
SCHOOL ACTIVITIES
PROCESS:
MANAGEMENT OF FUNDING PROGRAMS
TRANSLATION INTO SUBSTANTIVE PROGRAMS
OPERATION OF SUBSTANTIVE PROGRAMS IN SCHOOLS
INPUT/PROCESS VARIABLES:
MANAGEMENT EVALUATION
(EACH LEVEL)
AGENCY MANAGEMENT
PROGRAM MANAGEMENT
GRANTS MANAGEMENT
OPERATING EVALUATION:
(EACH SCHOOL/LEA)
PROGRAM IMPLEMENTATION
• MANAGEMENT ACTIVITIES
• TEACHER ACTIVITIES
PROJECT CONTENTS
• PROJECT COHERENCE
• PROJECT RELEVANCE
OUTCOME MEASURES:
INTERMEDIATE VARIABLES
ATTITUDINAL + COGNITIVE CHANGES —
ESTIMATES OF "SCHOOL WORTH"
SOCIAL ACCEPTANCE/ALIENATION
ESTIMATES OF SELF WORTH
ANXIETY / REJECTION
ETC.
DEPENDENT VARIABLES
ACADEMIC ACHIEVEMENT
DROPOUTS/GRADUATES
ATTENDANCE
SCHOOL ADJUSTMENT/BEHAVIOR
ETC.

analysis, would allow the correlation of process variable changes with outcome variable changes. Such analyses could provide the basis for assessment of both management and implementation performance in relation to the products of these programs - the changes in the student population. Such evaluation would provide at least partial answers to questions concerning whether or not specific programs work and also which of several related but different program implementation approaches work better than others.

The extension of this goal model approach to multiple programs would be termed the systems model approach, and an abbreviated paradifm of such comparisons is illustrated in Exhibit 5. This shows the situation which could exist given adequate measurement of the Inputs/Processes/Programs and Income and Outcome variables for a set of parallel Program implementations - either between schools, or districts, or States, or even conceivably between Federal funding programs and management techniques as applied to different programs and activities. The multivariate comparisons which could be drawn between the Program and process variables in relation to the outcome variables, as well as simply those between processes and between outcomes, separately, would allow the evaluators to draw conclusions related to the overall adequacy of the different programs on each of several bases - including management, implementation, in-school projects or processes, and pupil changes.

EXHIBIT 5

System Model Approach: Multi-Program Evaluation


Incoming
Students
(Population
Variables)
Income 1
Income 2
Income 3
Income 4
Program 1
Program 2
Program 3
No Program
Process 1
Process 2
Process 3
Process 4
Outcome 1
Outcome 2
Outcome 3
Outcome 4

The above model defines four types of variables, which are listed, with some examples of each, in Exhibit 6. These types are: Population variables, relating to the definition of the characteristics of the incoming students for any given program or project in a school or district; Input/Process/Program Variables, relating to the characteristics of the managment and implementation of the specific funding and substantive programs which are impacting on the given incoming population in the school; Intermediate variables, which define the set of "internal" characteristics of the students which may or not be modified by the programs and, if modified, may or not affect measures of the fourth category; the Dependent Variables, which can be though of as the ultimate outcome measures and include the overt behaviors of the students and are, in general, those characteristics of the student population which are intended to be modified by the educational support programs.

The concepts and models described above are believed to be adequate to meet the essential evaluation requirements posed by the Federal/State/Local Delivery System. It is further believed that the longitudinal change model applied to the comparative evaluation of both outcomes and input/process variables will actually allow formulation of the comparative judgements about different programs and processes, of both management and operation of programs, which are necessary to the iterative

EXHIBIT 6

Some Examples of Variables Related to Elements of The Evaluation Paradigm

Population Variables	Input/Process/Program Variables	Intermediate Variables	Dependent Variables
Socio-economic Characteristic	SEA/LEA Characteristics	Pupil Attitudes	Academic Achievement Program
Ethnic Characteristics	School Plant/Facility Characteristics	Motivation	Graduation/ Dropouts
Age Groups	Teacher Characteristics	Cooperation	School Adjustment
Disabilities	Guidance/Counseling Staff Characteristics	Etc.	Delinquency
Geographic Locations	Grants Management Characteristics: Federal/ State/LEA		Truancy
Urbanization			Etc.
Etc.	Agency Management: Federal/State/LEA/School		
	Program Management: Federal/State/LEA		
	Etc.		

development of a well managed and effective system of educational support programs.

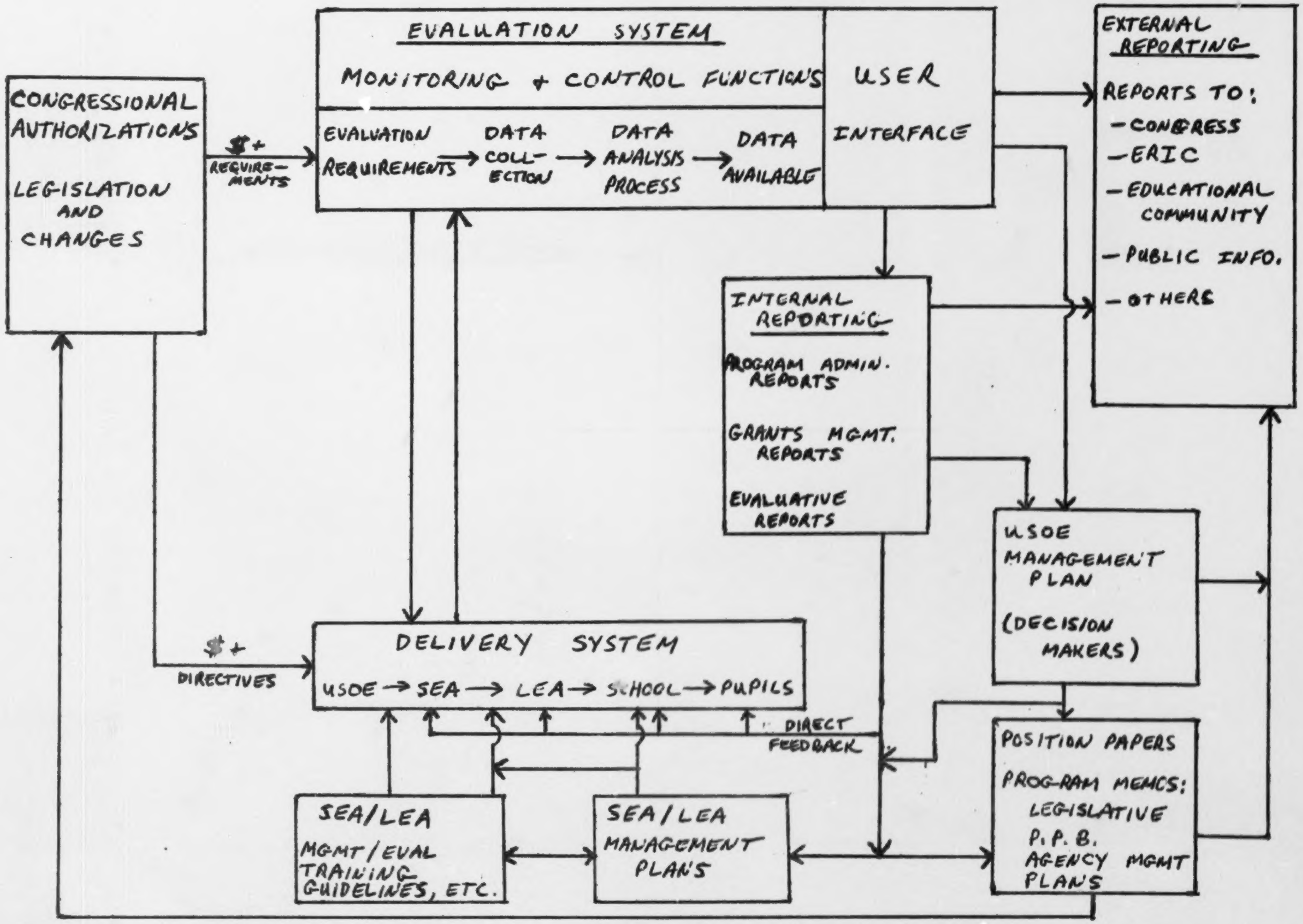
EVALUATION SYSTEM AND SYSTEM ELEMENTS

The conceptual development of the evaluation system in relation to a simplified depiction of the Delivery System is illustrated in Exhibit 7. This shows the Evaluation system functioning in an overlying monitoring and controlling relationship to the total Devlivery System, as it must in order to perform its major functions related to the total management tasks. This Exhibit also indicates the eventual relationships between the Delivery System, the Evaluation system, and the developing management plans of USOE and the State and Local Agencies. As shown, the outputs of the evaluation system, both internal and external are intended to provide data and reports feedback directly to the State and Local Agencies as well as to the Federal managers and evaluation personnel. This feedback, together with the potential for detailed interpretation of data and incorporation of these into the overall management plans, can be used to aid the gradual evolution of the State and Local management plans and capabilities. Whether this will operate through direct outputs to the State and Local Agencies, as indicated above, or through the Chief State School Officer (CSSO's) association with the developing Belmont organization is incidental to the actual system development, but such involvement could develop through either route and probably will include both.

The major management loop implicit in the overall system development and its extensions is that leading to the managment plan developments

EXHIBIT 7

EVALUATION OF THE DELIVERY SYSTEM AND REPORTS UTILIZATION


CONGRESSIONAL AUTHORIZATIONS
LEGISLATION AND CHANGES
$ + REQUIREMENTS
EVALUATION SYSTEM
MONITORING + CONTROL FUNCTIONS
EVALUATION REQUIREMENTS → DATA COLLECTION → DATA ANALYSIS PROCESS → DATA AVAILABLE
USER INTERFACE
EXTERNAL REPORTING
REPORTS TO:
- CONGRESS
- ERIC
- EDUCATIONAL COMMUNITY
- PUBLIC INFO.
- OTHERS
INTERNAL REPORTING
PROGRAM ADMIN. REPORTS
GRANTS MGMT. REPORTS
EVALUATIVE REPORTS
USOE MANAGEMENT PLAN
(DECISION MAKERS)
$ + DIRECTIVES
DELIVERY SYSTEM
USOE → SEA → LEA → SCHOOL → PUPILS
DIRECT FEEDBACK
POSITION PAPERS
PROGRAM MEMOS:
LEGISLATIVE
P.P.B.
AGENCY MGMT PLANS
SEA/LEA MGMT/EVAL TRAINING GUIDELINES, ETC.
SEA/LEA MANAGEMENT PLANS

mentioned above. The provision of data to the USOE/CSSO management personnel will contribute to decisions and development of policy and position statements, program memos and related evaluative and management products directed toward the States and local districts, or to Congress, as warranted by the data indications drawn from the system. These USOE/CSSO policy developments and position papers will also be inputs to the development of State and Local management plans.

These management personnel, responsible for the crucial decisions about Funding Programs, Grants Applications and Federal Policy are critically important internal users of these evaluation system data. It is assumed that these personnel can have access to all data sheets and internal and external reports routinely generated by the System and the associated personnel. They should also have the capability to make specific inquiries of the system data base and to institute new searches or analyses of data to obtain data needed for decision making but not anticipated in the original design of routine output capabilities. These decision makers and their currently identified needs, must play a large part in the initial development of the evaluation system and its data analysis plan through definition of their information requirements. The JCES data system must be designed, explicitly, to provide the information and data needed by these personnel.

Exhibit 7 also indicates roughly the kinds of reports which will be output from the system and some of the potential users of these reports. Without detailing these for now (See System Reporting Requirement, below), they will consist primarily of either data sheets, containing essentially raw or summarized data, or finished, interpreted reports of analyses related to either Programs or to Target Groups. Since the major output of the system will include the mandated Program reports, the external reporting requirements include the dissemination of these and similar reports to Congress, to the Educational Research Information Center (ERIC) and to other external consumers.

This exhibit also indicates the development of a User Interface portion of the evaluation system. Whether this be a manual or man-machine interface (assuming part of the evaluation system will be computerized) is undefined at this point; the importance of recognition of this interface lies in its relationship to the provision of data sheets and reports generated for specific purposes. This interface supplies the various users - both internal and external to USOE - with the required data outputs to answer either routine or special questions based on the data availability and the data analysis system.

Total System Approach

The development and implementation of the JCES as described above is intended to follow a total systems approach; that is, the elements of the system are intended to follow an integrated development and application plan and the analysis and evaluation of the resultant data will be based on a comprehensive data analysis plan, relating all of the data from all instruments.

The total system can be throught of as accomplishing two major tasks and supporting a third activity, external to the system itself but related to the continuing evaluative development of the Delivery System. These are:

1) The system will directly accomplish the reduction and consolidation of the various statistical, fiscal and evaluative data input requirements of management evaluation for the Federal, State, and local agencies; and, it will be designed to provide direct feedback reports on a hierarchical basis, and on-demand, to personnel operating at each of these levels. These personnel served include Agency Managers, Program Administrators, and Grants Managers at each level, as well as eventually the Congressional and public information needs associated with this area.

2) The system will allow direct assessment and evaluation of that subset of educational projects included within the sampled groups (those actually evaluated with the different instruments) and an extrapolation, on the basis of the samples, to the entire population of projects. This assessment and evaluation can include the assessment of which kinds of projects work best under what conditions and for which kinds of target

pupils, as well as the identification of the additional needs among target groups for educational support of various kinds.

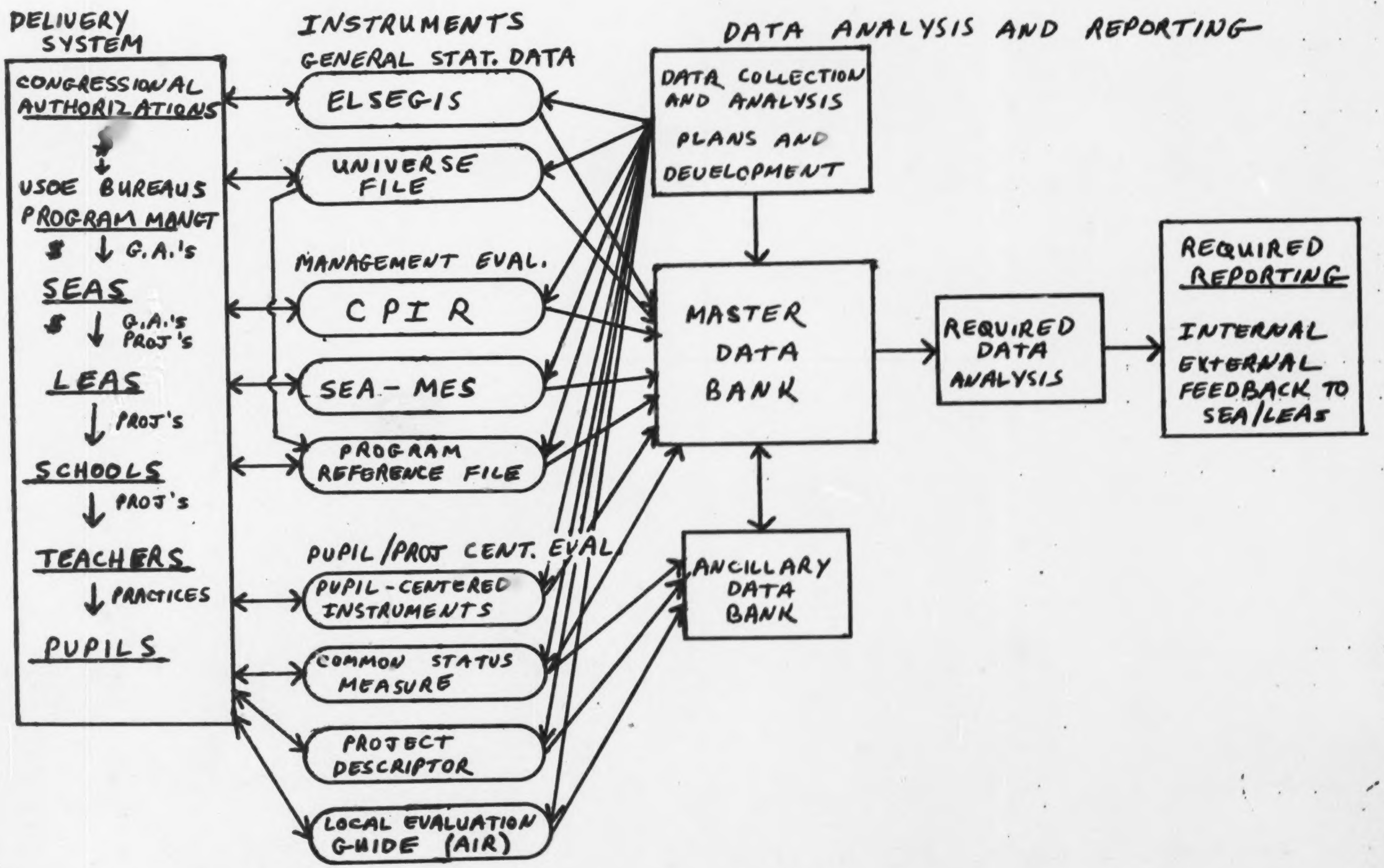
3) Secondarily, through the accomplishment of the evaluative functions above, the system will contribute directly to the continuing modification and improvement of management activities at all levels of the delivery system. This contribution to the better interactive management of the Funding Programs and translation of these into educational projects can only accrue under conditions of mutual Federal/State/ Local recognition, acceptance and dedicated application of the information to be derived from the satisfactory performance of the above two functions. This anticipated outcome of system development and implementation is more dependent upon external "people factors" than on the specific development of the JCES; however, this aim is important to the development and specific implementation of the system elements and to the report generation capability, in particular. These must be designed to facilitate the mutually interactive utilization of the data derived and processed by the system.

Development of the system necessary to meet these functional needs is likely to require an iterative cycle of continuing refinement due to changing recognition of arising needs in both the management and project evaluative areas. Modifications of available data usually result in the evolution of novel desires for utilization which may cause new data collection or analysis needs, or simply the generation of new reporting formats. In any case the current intent is to design the total system and to implement it to the degree possible and to allow it to evolve to meet such new needs as may be defined later. The current design calls for an integrated set of instruments aimed at obtaining statistical, financial, student, and project data and a complete data analysis system to provide the interrelated analyses necessary to provide the summary and evaluative outputs required for effective management and evaluation practices to be instituted at each level of the Delivery System. Each element of this system will serve a definite purpose and will not generally be redundant with other instruments. Some redundancy is probably unavoidable in survey and data collection instruments to be administered at separate times in the same levels, schools, etc., but this is to be reduced to the bare minimum consistent with the demands for both data identification and data consistency checks.

The expansion of the evaluation system design shown in Exhibit 8 indicates the set of instruments currently under development and the relationship of these to the the three major data collection and analysis functions which can be identified as: the General Statistical Data Subsystem; the Management Evaluation Subsystem; and, the Project/Pupil Centered Evaluation Subsystem. Instruments comprising these subsystems are described below with repect to purposes, data types and applications.

EXHIBIT 8

ELEMENTS FOR EVALUATION OF DELIVERY SYSTEM


DELIVERY SYSTEM
CONGRESSIONAL AUTHORIZATIONS
$
USOE BUREAUS PROGRAM MANGT
$ G.A.'s
SEAS
$ G.A.'s PROJ's
LEAS
PROJ's
SCHOOLS
PROJ's
TEACHERS
PRACTICES
PUPILS
INSTRUMENTS
GENERAL STAT. DATA
ELSEGIS
UNIVERSE FILE
MANAGEMENT EVAL.
CPIR
SEA-MES
PROGRAM REFERENCE FILE
PUPIL/PROJ CENT. EVAL.
PUPIL-CENTERED INSTRUMENTS
COMMON STATUS MEASURE
PROJECT DESCRIPTOR
LOCAL EVALUATION GUIDE (AIR)
DATA ANALYSIS AND REPORTING
DATA COLLECTION AND ANALYSIS
PLANS AND DEVELOPMENT
MASTER DATA BANK
ANCILLARY DATA BANK
REQUIRED DATA ANALYSIS
REQUIRED REPORTING
INTERNAL
EXTERNAL
FEEDBACK TO SEA/LEAS

Descriptions here are general, but Appendix E presents detailed descriptions of all instruments together with an item-by-item indication of the required data.

The General Statistical Data Subsystem

This is not really a new development but rather an incorporation into the system of two existing NCES instruments and files to serve primarily as reference sources and as descriptions of the population of Districts, schools and pupils. These instruments are the Elementary and Secondary Education General Information Survey, (ELSEGIS) and the Universe File. Together they comprise the basis for general information development about the total population with respect to some very limited population and numbers data.

1) ELSEGIS - This instrument is a survey instrument used to assess the existing school systems and pupils of the country and its emphasis is on collection of these data about all schools instead of on those involved in Programs under ESEA or NDEA, as other instruments sometimes do. It collects data on: the number of schools in local systems by organizational level, grade, and size of system; enrollment and pupil/teacher ratios in local public school systems by account and size of system. These data are collected by a mail survey of a sample of public school Districts developed and implemented by NCES.

The degree to which this instrument will be incorporated into the total JCES is not yet fixed. The data collected partially overlap with that from the CPIR (discussed later) and this may indicate that the redundancy should be eliminated. But decisions on these points must await detailed examination of both sampling and data analysis plans which are not yet complete for either instrument. In any case, the ELSEGIS data would be the basis for routine statistical summaries similar to those already prepared. These summaries could be useful to the managers and decisions makers at all levels, so whether the instrument and its raw data are incorporated in to the JCES or not, it is likely that the end-products of the survey will be incorporated into the output system of the JCES.

2. Universe File - This is essentially a canvassing of all schools in the country and the determination of their enrollment by grade and the instructional staff they maintain. These data are collected through a mail survey completed at the District level. The major purpose of the File resulting has been, and will continue to be, its utility as a sampling frame for sample generation for other survey applications.

The Universe File Data will certainly be incorporated into the JCES development for the sampling purposes. These data would probably be maintained in NCES as they are currently, but the availability as a sampling frame would be used in the design and implementation of the various other JCES instruments. As indicated above the outputs of the general data subsystem will at least be used in the JCES by selected internal and external consumers, but it is not expected that any novel reporting will be generated from these instruments. The single possibility for such unique analysis and reporting would be the cross relation of these data with those from other instruments, and this would be only possible at a general level because of probable lack of sample duplication.

The Management Evaluation Subsystem

This subsystem contains the set of instruments directed at obtaining the basic data required to evaluate the major management functions at each level of the management chain. There are three instruments which are to be developed and applied to this evaluation purpose. These are the Program Reference File (also important to the Pupil/Project Evaluation process), the Consolidated Program Information Report (CPIR), and the still embryonic State Education Agency Management Evaluation Survey (SEA-MES). These are outlined below.

1. Program Reference File - This instrument will create a permanent file, to be updated annually, that will contain information on all schools and school districts in the 20 State Belmont Group. In addition to the name and address of each school and its school districts, the following data will be stored in the file:

Name of District Superintendent

Name and Telephone Number of Person Responsible for Federal Programs

Grade Span of School

School Membership

Degree of Urbanism in School Attendance Area

Listing of Federally Supported Aid Programs in Which Schools Participate by Grade Level.

This instrument and the File will be partially based on the Universe File in that the initial generation of the basic identification data will be used to canvass the Belmont State Schools for the additional data required. Once these data are available, they will comprise a needed universe record of the programs active in schools and Districts for the Belmont States. As such this File will serve as the basic sampling frame for development of special State oriented samples and Belmont aggregate samples for the special studies of these States using the major instruments of the JCES and perhaps some supplementary instruments as might be developed in conjunction with the individual States (or all States.)

2. Consolidated Program Information Report (CPIR) - The CPIR is designed to serve three broad purposes: a) to permit State and Federal program officers to determine the extent to which Federal/State programs and services reach pupils and schools as intended; b) to assess the broad elements of program effectiveness and efficiency at the local

district level; and c) to satisfy Federal statistical reporting requirements for Federal Funds. The CPIR will replace many of the 123 statistical reports that were previously required by USOE. In replacing these various reporting requirements, the CPIR and its central analysis, together with the capability for feedback to all management levels, will provide the capability for direct output of summary and raw data to LEAs, and to SEAs as well, which have been previously unavailable. It is presumed that these data availabilities will increase the capability of Agency and Grants Managers to monitor and improve the management activities for which they are responsible.

Among the data that will be collected by this instrument are:

a) Dollars expended by source of funding

b) Services and programs provided by these funds

c) Identification of the number of children by target group needing services and number benefiting from the programs and services

d) Staffing patterns by programs and services

e) In-service education by source of funding

The instrument will for the first time provide a coordinated look at the various Federal funding programs impacting on local school districts. The 1969 CPIR has been sent out to the school districts and the 1970 form is presently in preparation.

3. State Educational Agency Management Evaluation Survey (SEA-MES) - Although in the planning and development stage currently, the SEA-MES will be an instrument (or more than one) designed to collect information required to evaluate the State and local agency management of Federal funding accounts and grants for specific projects. It is intended that the instrument(s) will replace many of the specific fiscal accounting reports currently required from Local and State agencies through incorporation of these separate reports into a consolidated instrument set. Application of some of these instruments may be as often as quarterly but the major reporting will probably be summarized in an annual documentation.

At the moment, this is in the initial planning stage with a working draft planned for presentation at the second quarterly Belmont meeting sometime in July 1970. The instruments are viewed as questionnairessomewhat similar in design to the Consolidated Program Information Report. This evaluation will be limited to details about the management of the program. For example, they will deal with areas such as:

What programs do you administer?

What types of people assist you in managing these projects?

How many of each type?

What funding levels are dealt with, etc.?

The information accumulated will then be analyzed and used to evaluate how effectively the program was managed.

As a separate part of the SEA-MES the questions of "needs assessment" will probably be addressed. This would be a continuation of current assessment requirements, since as part of the ESEA Title III program, the 50 states were alloted funds during FY '68 and FY'69 to make an assessment of each of their needs in the area of education. These assessments have been completed and reports have been received which identify the educational needs of each state. In addition, the states were asked to determine which of the identified educational needs are critical and to determine those for which Title III might effectively demonstrate innovative and exemplary programs. However continuing re-assessment through the medium of the SEA-MES would assist Federal and local managers in fund allocation decisions. The previous report data could also be incorporated into the JCES, if desirable. These could then be analyzed by OE to summarize the most critical needs of the Nation to determine a strategy for the Title III program in relation to other Programs.

These instruments and the data collected will form the basis for multiple specific outputs of the evaluation system. As separate fiscal accounting requirements for the USOE and/or State or Local Agencies develop, separate reports may be specified to meet these needs. However, an additional and major aspect of these data will be their utilization in relation to Project/Pupil evaluation data (see below) to provide indications of benefits/costs ratios for different programs and projects. Thus, these management data will provide the basis for direct management evaluation by managers at all levels and will simultaneously allow the more effective evaluation of the product aspects of the Substantive Program Subsystem of the Delivery System.

The Pupil/Project Centered Evaluation Subsystem

This subsystem forms the heart of the product evaluation capability of the JCES since it is the source of all specific data about pupils, their progress, and the specific activities which have been provided, either under Federal, State or Local funding programs. The instruments to be described below will allow data collection concerning specific Districts, schools, teachers and pupils in addition to the development of descriptions and evaluations of local projects which have been implemented under diverse funding programs. These data can be analyzed to answer the crucial questions relating to project effectiveness in the field and what kinds of projects work best with which target groups under what kinds of conditions.

1. Comprehensive Pupil- Centered Instruments - This set consists of four parts designed to gather data on the school district, the school, the teacher, and the pupil. Part of the Pupil Centered Instruments will be aimed at determining the extent to which individual students participate in the various project and activities described through the Project Descriptor (See below). In addition, the Pupil Centered Instruments will gather data on the background of the students

participating in the projects, and their school achievement.

The School District Questionnaire collects the following types of data:

a) General Information (including salary data and number of schools in the district)

b) Test Data Information

c) Parent Involvement Information

d) Personnel Training Information

The Principal Questionnaire collects data of the following types:

a) General School Information (including location, membership, and attendance data)

b) Instructional Organization

c) School Facilities

d) Student Body Description

The Teacher Questionnaire collects the following types of data:

a) Teacher Background

b) Class Characteristics and Organization

c) Teaching Method and Program of Instruction

d) Teaching Concerns

The Pupil Questionnaire collects data as follows:

a) General Information (including grade, sex, age, and absences)

b) Pupil Background Characteristics

c) Academic Program Participation

- - - -

d) Ancillary Service Participation

e) Pupil Behavior

f) Pupil Performance

Only the Pupil Centered Instruments for Elementary Schools have been developed in draft form. The final version of these instruments will be submitted to NCES and the Bureau of the Budget for clearance on January 16. Work has not yet begun on the secondary school instrument.

The Pupil/Project Centered Evaluation Subsystem will depend primarily on the set of data generated through the four Instruments described above since these are the only instruments which are likely to be implemented throughout the Belmont States at this time. However, there are three other somewhat related instruments under development which may be used in various ways in conjunction with the JCES to augment the data available to the users of the system. These three instruments are considered as part of the Project/Pupil Evaluation approach and thus are described briefly below.

2. Common Status Measures - These consist of two tests, Basic Verbal Status and Occupational Cognizance. They were originally developed at two levels for application to National samples of children at the 4th and 11th grades. Currently, these measures are viewed as the introduction of a new National survey, and the desire to avoid the burdens of new surveys suggests that these instruments may find only limited

use in special evaluations of special programs or groups, or might be welcomed into some or all of the Belmont States on a local survey basis.

The Basic Verbal Status measure has 12 questions. The skills being measured are vocabulary recognition and reading comprehension. In no case is the student required to make any generalizations or inferences about the selection. The Occupational Cognizance measure is designed to assess the student's knowledge of occupations and his occupational-educational expectations. This measure will have 12 questions, the first ten of which will test the pupil's knowledge of:

a) the education or training required for specified occupations

b) the nature of work involved in specified occupations

c) the relationship of other occupations to a specific occupation

d) the recognition of the field of work corresponding to a specified occupation.

The last two questions ask about the student's own occupational and educational expectations. The Common Status Measures are presently in draft form and both the elementary and secondary school forms are currently being pre-tested.

3. Project Descriptor Questionnaire - This instrument is based on a taxonomy of projects, programs, and activities. It will pro-

vide information on the various types of projects and programs operating in the schools. For each project the following types of information will be gathered:

a) Type of Project or Activity

b) Source of Funding

c) Duration of Project

d) Number and Background Characteristics of Participants

e) Organization for Instruction Including the Teaching Methods Employed, Subject matter, and Characteristics of Cognizant Personnel

f) Facilities, Equipment and Materials Utilized

g) Project administration (including planning, evaluation, and dissemination)

The analysis of the data from the project descriptor will provide detailed information relative to the services provided through each Federal legislative title. For example, reports will indicate the structure, methodology, materials, equipment, and personnel used in projects in compensatory reading in secondary schools. Because the descriptor will include information in the types of pupils participating in the various projects, analyses will report the kinds of services being rendered to various kinds of pupils within States. When the entire system is implemented, the relative effectiveness of various kinds of services for various kinds of pupils will be reported. Program managers in State agencies and at the U. S. Office of Education will thus have comprehensive pictures of the kinds of services each of the Federal programs is generating.

4. The Local Evaluation Handbook (AIR Guide) - This is a manual which is designed to assist local and State personnel in the preparation of local project evaluation reports in standardized format. It contains guidelines for the content and preparation at the level of narrative reports on Federally-funded projects. These reports parallel the information obtained at the school level by the Project Descriptor, which was developed separately from the Guide. In order to further standardize these reports and bring them in line with the data collected from the Project Descriptor, it has been recommended that the Project Descriptor Taxonomy be included as an appendix to the AIR Guide and used in conjunction with it.

The National application of these two new instruments, the Project Descriptor and the Local Evaluation Handbook, faces the same problems discussed under the Common Status Measures, above. However, they hold much promise for development of an important set of data about local projects and their implementation that is not generated by any other current source. On this basis it has been suggested that these instruments be implemented through the Federal/State/Local management chain on an informal basis, probably starting through the Belmont Organization and perhaps extending eventually to other States.

It is not anticipated that this approach would be universally successful, in that many local systems and school might be unable or reluctant to participate. However, even a small and non-representative group of such coordinated and standardize project evaluations, developed by local personnel, would be useful to all levels of managers in the Management chain. Such evaluations could lead to a much clearer picture of what is working, and where, and how. Such data are simply not available now, and they could be of much use to Program Administrators and Grants Managers in determining the substantive suitability of new project applications. They could also be disseminated widely to Local administrators and be useful in informing these personnel of what has worked and what has been only marginal in other locations and applications. Such information might assist the more effective application of local as well as Federal and State funds in the Districts. With limited funding (a constant local problem) informed decisions about such allocation are required to improve effectiveness. And for these purposes the information from other project developments and their evaluations by the local personnel could be invaluable.

Relationships of JCES to Existing Evaluation Activities

The relationship of the JCES development to the ELSEGIS and Universe File of the existing activities has been described above. However additional ties and substitution relationships also exist. Some of these are briefly described here. The JCES does not represent the first effort to evaluate the functioning and effectiveness of Federal educational support programs. Evaluation efforts have been carried out in the past in connection with ESEA Titles I, II, III, and NDEA Titles III and V-A*. The frequency of these studies has not been annual, but some have been carried out more than once. In addition to these, there have of course been a great many state and local studies attempting to evaluate the impact of Federal programs in education. Further, the fiscal accounting system of legislation, requires a continuing series of financial reports both quarterly and annual.

It should also be noted that the JCES effort pertains, at this time, only to the 20 Belmont states. Thus, it is legitimate to ask the extent to which the JCES duplicates or parallels an existing evaluation system. The answer to this question is "not at all." There is really no present "system" in any systematic sense except for the financial and narrative formatted reports requred by USOE. It is planned that these evaluation efforts will be consolidated into the various subsystems of the JCES. Two parts of the JCES, the Consolidated Program Information Report and the Elementary Pupil Centered Instruments will be extended to all 50 of the states in the near future, and it is hoped that the remainder of the JCES will be ready and accepted into the 50 states by 1973. In fact, much of the present evaluation effort will be effectively subsumed under the new system, since the 1969 Survey of Compensatory Education (Title I, ESEA) forms the basis for the new 1970 Pupil Centered Instruments (covering all Titles) and will be extended in 1970 to all 50 states.

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* As noted previously, a review of all Legislative Titles which will be evaluated by the JCES is presented in Appendix C to this report.

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The System will handle program information sources such as: 1) Application reports, 2) Fiscal reports, 3) Project Evaluation reports, 4) Statistical reports, 5) Program Evaluation reports, 6) The previous national evaluation studies referred to above, 7) Educational audits, and 8) Program reports. With respect to the CPIR, the 60 million or so response items contained in these reports, requiring some 32 man years per year to punch and edit, will be reduced on the CPIR to about 4 million items needing only 8 man-years to punch/edit.

Thus, the components of the JCES are designed ultimately to replace the many separate studies and reports for OE funded elementary and secondary programs. For example:

1. The CPIR replaces existing local statistical report for ESEA Titles I, II, III, NEA Titles III, V-A, and the neglected and delinquent statistical report under ESEA Title I.

2

2. The School/Pupil Instruments replace separate national surveys in ESEA Titles I, II, III, and NEA Titles III, V-A.

3. The Project Descriptor Instruments and the AIR Guide ultimately may be used to standardize local project reports mandated for ESEA Titles I, III, VII and VIII.

4. The SEA Management Report ultimately may replace mandated State statistical and evaluation reports for some titles of both ESEA and NDEA.

Comprehensiveness and Redundancy Analysis

As part of the detailed study of the developing JCES, a series of analytic examinations of the various elements of the JCES were conducted. These included analyses of the comprehensiveness of the elements of the system with respect to the basic evaluation questions asked by Program Managers, and analysis of relationships of element coverage to the currently required reporting schedules for all legislative Titles, and an examination of the item-by-item redundancy among the system instruments. The results of these analyses are reported below under the headings of Comprehensiveness and Redundancy. Some discussion of potential modifications of elements and their applications follows these reports.

Comprehensiveness of JCES Elements

A major question in examining an attempt to evaluate anything is: "Does evaluation approach actually cover and evaluate everything it is supposed to?" The question asks whether the system is comprehensive of the evaluation needs with respect to the subject of evaluation. This question has been examined for the JCES elements through two approaches: first, the coverage of the JCES elements in relation to the basic evaluation questions posed by Program Managers in USOE was reviewed; second, the relationship of the JCES elements to the current USOE reporting requirements (from States and Local Agencies) was reviewed. These two examinations are reported below.

Evaluation Questions and JCES Elements - A series of twelve evaluation questions were formulated from the sets of policy and evaluation questions posed by USOE Program Managers. These were presented earlier as part of the Section on JCES, Goals and Development. These questions were abstracted from the several highly similar sets of policy questions prepared by the Programs Managers of the various Titles within the various Bureaus of USOE. The question examined was whether or not the current JCES elements provide coverage of each of these formalized questions. Exhibit 9 presents the matrix of JCES elements set against the 12 Evaluation Questions. (The questions are abbreviated for exhibit purposes.) Within the body of the matrix, a check has been placed at the intersection of an evaluation question with a JCES instrument if that instrument provides some (not necessarily all) of the data required to provide an answer to the specific questions represented by the short titles shown herein. It should be noted that only the major intents and the main sections of each instrument were considered in relation to the questions at this time. An item-by-item analysis of these relationships has been partially completed

This preliminary analysis indicates that the JCES elements can provide most of the kinds of data required to answer the questions posed for response by the Program Managers. The matrix also shows that several different elements of the JCES can be expected to provide some data in relation to most of the questions. Although this does not necessarily imply redundancy of the separate instruments, this initial analysis and examination of the general contents of the individual elements led to the conduct of an item-by-item analysis of the overlap across instruments.

EXHIBIT 9

		CPIR	PCI	PDI	Narrative Reports from Local Evaluation and Handbook (AIR Guide)	CSM	PRF
1.	General School Population	X	X	X	X		X
2.	Participating/Non-Participating Pupils	X	X	X	X		
3.	School Plants, Facilities	X		X	X		X
4.	School Personnel	X	X	X	X		X
5.	General Services Provided	X	X	X	X		
6.	Program Administrator	X	X	X	X		
7.	Cost Funding	X		X	X		X
8.	Special Programs	X	X	X	X		X
9.	Measure of Program Effectiveness		X	X	X	X	
10.	Benefits Derived		X	X	X		
11.	Research Activity		X				
12.	School Community Interactions		X	X	X		

CROSS TABULATION OF EVALUATION QUESTIONS WITH COMPONENT SOURCES OF DATA

The results of this redundancy analysis are reported later in this section of the report.

Reporting Requirements and JCES Elements. -- An analysis similar to that presented above was performed to evaluate the comprehensiveness of the JCES elements with respect to the current legislative requirements for reporting. These were derived from a table provided by USOE/PPE and were examined against the general content and major sections of the various instruments. As in the above examination of the JCES instrument coverage, a matrix was constructed and checks were entered at the intersections of the individual elements and a report title to which it was believed the JCES instrument pertained. This matrix is presented as Exhibit 10.

Two facts should be pointed out here. First is the fact that this examination was performed without benefit of any detailed information on what the listed reporting requirements were supposed to be comprised of in the way of data. The comparison that was made in creating this matrix was between the Title of the report and the general content and major data indications drawn from the JCES instruments. Thus, there may be many wrong inferences in this matrix, simply because they were made on the basis of the report titles alone. The second major fact to be made clear is that this comparison has been made on the basis of equally putative inferences with respect to the contents and coverage of the to-be-developed SEA-MES, the State management evaluation survey device. This device is in the planning stage only, with no draft instrument or outlines available for examination. These two facts combine to render the comparisons shown in Exhibit 10 very tentative. Nonetheless, the Exhibit provides a useful broad picture of the coverage of the system.

EXHIBIT 10

COMPREHENSIVE EVALUATION SYSTEMS ELEMENTS AS RELATED TO CURRENT BESE/BVTE REPORTING REQUIREMENTS

BESE PROGRAM REPORT REQUIREMENTS	ELEMENTS								
	Prog. Ref. File	Prog. Descrip.	Local Eval. (AIR Guide)	Pupil Cen. Instru.	CSM	ELSEGIS	CPIR	SEA-MES	Application Proposals/Level
ESEA 89-10 as amended Title I Education Deprived Children in low income areas									N/A - Approval at SEA level
1. SEA Evaluation of Title I Programs (Admin) OE 4320		x	x				?	x	
2. CPIR - OE 4484	x						x		
3. Survey of Compensatory Education OE 4434, 4434-1, 4434-2, 4434-3				x	x				
4. SEA Admin. Expenditures & LEA Program Expenditures OE-4319		x					x	?	
5. Quarterly Report on Distribution of funds to LEAs OE-4384							?	?	
6. AIRS Project descriptions (proposed)			x						
7. List of ESEA Title I LEA - OE 2320	?	x						?	
ESEA 89-10 Title I Neglected and Delinquent children in Institutions									N/A - Approval at SEA level
1. Evaluation of N&D Program (SEA, State Agencies & Institutions) OE 4426			x						
2. CPIR - OE 4484							x		
3. Stat. Report from State Institutions OE 4375-1						?	x	?	
4. State Agencies Expenditures for N & D Program Expenditures OE 4319		x					x	?	
5. Annual Survey of Institutions for Neg. & Del. children - 4376	x					?			
6. Summary of Approved Projects OE 4453		x							

	Prog. Ref. File	Prog. Descrip.	Local Eval. (AIR Guide)	Pupil Cen. Instru.	CSM	ELSEGIS	CPIR	SEA-MES	Application Proposals/Level
7.Quarterly on distribution of funds to State agencies 4384								?	
ESEA 89-10 Title I Migratory Children of Migratory Agri Workers									1.State Application OE 4389, 4389-1, 4389-2, 4389-3
2.SEA Evaluation of Title I Migrant Program OE 4427		x	x				x	x	
3.CPIR - OE 4484	x						x		
4.SEA Statistical Report OE 4375-2	x	x		x			x	x	
5.SEA Migrant Program Expenditures OE 4319		x					x	x	
6.LEA Summary of Approved Projects - OE 4389-3	?	?						?	
7.Quarterly Report on Amounts of Migrant Funds Expended OE 4384		?						?	
ESEA 89-10 Title I Indian Children in BIA Schools									1.Application (Suggested format as used by LEA's) (unnumbered)
2.Evaluation Report from BIA (unnumbered)		x	x				x	x	
3.Statistical Report from BIA (Same data elements as CPIR OE 4484)	x			x			x		
4.Financial Report on Program Expenditures OE 4319		x					x	x	
5.Record of Approved BIA Title I Projects	?	x						x	
EOA 88-452 90 Follow Through & State Technical Assistance									1.Application for Follow Thru OE 4473

	Prog. Ref. File	Prog. Descrip.	Local Eval. (AIR Guide)	Pupil Cen. Instru.	CSM	ELSEGIS	CPIR	SEA-MES	Application Proposals/Level
									2.Application for State Tech Ass't. OE 4455
									3.Application for Supplementary Training OE 4475
4.Evaluation OE Report (Conducted under OE contract)		x	x	x	?		?	x	
5.CPIR - OE 4484	x						x		
6.Expenditure Report on LEA Program Expenditures OE 4473-1		x					x	x	
7.Follow-Thru Classroom Roster OE 4485	?							?	
ESEA 89-10 Title II School Library Resources									1.State Plan (SEA) OE 4306
									2.Description of Project OE 4357 (LEA)
3.Evaluation OE 4310-2		x	?	x	?		?	x	
4.National Survey (OE 4450, 4451 & 4452)	?			x		?	x	x	
5.CPIR - OE 4484	x						x		
6.Annual Financial Info. OE 4320		?					x	x	
ESEA 89-10 Title III Supplementary Centers & Services									1.State Plan OE 4441
									2.Summer Program OE 4442
									3.LEA Applications OE 4470,4470-1, 4470-2,4470-3, 4470-4,4470-5, & 4470-6
4.SEA Program Effectiveness OE 4462-1		x	x					?	
5.Dissemination OE 4462-2								x	
6.State Advisory Council OE 4462-3								x	

	Prog. Ref. File	Prog. Descrip.	Local Eval. (AIR Guide)	Pupil Cen. Instru.	CSM	ELSEGIS	CPIR	SEA-MES	Application Proposals/Level
7.CPIR - OE 4484	x						x		
8.SEA Statistical OE 4462				x	x		x		
9.SEA Financial Report OE 4462-4		x					x	x	
10.LEA Proposed Budget Summary Expenditures Report OE 4351		?					x	x	
11.SEA Report on Approved Projects OE 4461 (semi-annually)								x	
ESEA 90-247 Title IV State Planning and Evaluation (Reports Unspecified)	?	?	?	?	?	?	?	?	new
ESEA 89-10 Title V Strengthening State Department of Education									1.Application for Grant to strengthen SEA OE 4464 Amendment OE 4464-1 Certification OE 4464-2 2.Application (505) OE 4439 3.Application to Consolidate SEA Admin Funds OE 4437
4.Annual Report of (503) of Federal Ass't Program OE 4464-3		?	?	?		?	?	?	
5.Annual Report of Federal Ass't Program OE 4438		?	?	?		?	?	?	
6.Resource of SEA's OE 4446 Part I OE 4446-1 Part II	?	?						x	
7.CPIR Section 503 OE 4484							x		
8.Annual Report of Federal Ass't Program (505) OE 4440 Personnel & Expenditure		?	?				x	x	
9.Federal Share of State Administered Financial Ass't Programs OE 5188		?					x	x	

	Prog. Ref. File	Prog. Descrip.	Local Eval. (AIR Guide)	Pupil Cen. Instru.	CSM	ELSEGIS	CPIR	SEA-MES	Application Proposals/Level
ESEA 90-247 Title VII Bilingual Education									1. Preliminary Proposal OE 4468 2. Formal Proposal OE 4481 Stat OE 4481-1 Narrative OE 4481-2 Budget OE 4481-4 Assurance OE 4481-3 3. Application for Continuation OE 4481-1, 4481-4 4481-6 & 4481-7
4. End of Project Report: Stat OE 4481-1, Eval OE 4481-5, Dissem OE 4481-6		x	x	x		x	x	x	
5. Narrative OE 4481-2		x	x					?	
6. CPIR - OE 4484				x			x		
7. End of Budget Period - Final Expenditure Report OE 4481-6		x					x	x	
8. Quarterly Program Status (Proposed) OE 4487		x					?	x	
9. Estimated Expenditure - OE 4481-6		x					?	x	
10. OE 5140		x					?	x	
11. OE 5141		x					?	x	
12. Record of Grant Transactions		x					?	x	
13. Ledger Account		x					?	x	
14. Alteration of Approved Projects		x					?	x	
ESEA 90-247 Title VIII Dropout Prevention									1. Preliminary OE 4456 2. Formal - OE 4480 (4480-1,4480-2,3,4) 3. Application for Continuation OE 4480-1,5,6 & 7)
4. End of Project Report: Stat OE 4480-1 Eval OE 4480 -5, Dissem OE 4480-7 Progress Report & Proposed Activities OE 4480-6		x	x	x		x	x	x	

	Prog. Ref. File	Prog. Descrip.	Local Eval. (AIR Guide)	Pupil Cen. Instru.	CSM	ELSEGIS	CPIR	SEA-MES	Application Proposals/Level
5.Narrative OE 4480-2		x	x					?	
6.CPIR - OE 4484				x			x		
7.End of Budget Period - Final Expenditures OE 4480-6		x					x	x	
8.(Same type of report as used for Title VII above) 8 thru 14		x					?	x	
NDEA 85-864 Title III Science, Math, Modern Foreign Languages and Other Critical Subj. (incl. Arts & Humanities) (Grants to States)									1.State Plan OE 4193 2.Description of Projected Activities OE 4129
3.Narrative OE 4131		x	x					x	
4.CPIR - OE 4484				x			x		
5.Financial OE 4125		x					x	x	
NDEA 85-864 Title V-A & NFAHA Counseling, Guidance & Testing (Grants to States)									1.State Plan OE 4275 2.Description of Projected Activities OE 4135
3.Narrative OE 4134		x	x				x		
4.CPIR - OE 4484				x		x			
5.Financial OE 4139		x				x	x		
NDEA Title III (305), NFAMA 89-209 Loans to Private Non-Profit Schools									1.Loan Application OE 4018, 4018-1, 4018-2, 4018-3, 4018-4
2.Loan Payment Note OE 4032							?		
NDEA Title V-A Testing in Non-Public Schools (Reports Unspecified)	?	?	?	?	?	?	?	?	2.Application for Testing OE 4122

	Prog. Ref. File	Prog. Descrip.	Local Eval. (AIR Guide)	Pupil Cen. Instru.	CSM	ELSEGIS	CPIR	SEA-MES	Application Proposals/Level
CRA 88-352 Title IV Equal Educational Opportunities									
									1.Application (unnumbered)
2.Annual Evaluation		x	x				x		
3.CPIR - OE 4484				x		x			
4.Final Fiscal Report OE 1115		x				x	x		
5.Fiscal Operations OE 1115 (Semi-annually)		x				x	x		
BVTE PROGRAM REPORT REQUIREMENTS									
88-210 as amended by PL 90-576 Vocational Education Title I Part A - State Advisory Councils Part B - Programs for Students with Special Needs - Basic Grants to States Part D - Innovation Part E - Residential Voc. School Part F - Consummer & Homemaking Part G - Cooperative Voc. Educa. Programs Part H - Work Study Programs Part I - Curriculum Development Title III, Planning & Evaluation.									1.State Plan - Annual Description of Projected Activities OE 3110-1
2.Descriptive Rpt. of Voc. Ed Program Act. OE 4130		x	x					x	
3.No. & Type of Voc. Ed. Schools OE 3134	x	x					x	x	
4.Follow-up of Voc. Ed. Enrol. OE 3139		x	x						
5.Enrollment & Completion in Voc. Ed. OE 3138		x	x	x	x		x	x	

	Prog. Ref. File	Prog. Descrip.	Local Eval. (AIR Guide)	Pupil Cen. Instru.	CSM	ELSEGIS	CPIR	SEA-MES	Application Proposals/Level
6. No. of Teachers in Voc. Ed. OE 3136		x	x				x	x	
7. Status of Teachers OE OE 3136		x	x				x	x	
8. No. of State & Local Admin Personnel OE 3135		x	x				x	x	
9. Financial State of Voc. Ed. Funds OE 3129		x					x	x	
10. Expenditures by Source OE 3130		x					x	x	
11. Expenditures by Level OE 3131		x					x	x	
12. Expenditures by Purpose OE 3132		x					x	x	
13. Projected Status & Estimated Expenditures OE 3133	x	x	x				x	x	
89-4 amended by 90-103 Appalachian Vocational Educa. Construction Grants & Supplementary Construction Grants (Reports Unspecified)	?	?	?	?	?	?	?	?	1. State Plan - (States follow provisions of their state plan under PL 88-210)
81-920 Civil Defense Education									1. State Plans for Participation (Unnumbered)
2. Financial and Inventory Rpt. OE 3047-1,2,3 & 3c		?					?	?	
3. Monthly Activity Report OE 5126								?	
MDTA 87-415 as amended Manpower Develop. & Training Title II - On the Job Training Title II B - Inst. Training Title II C - Redevelopment Areas									1. State Training Plan OE 3117 & OE 3117-1 2. Training Proj. Info OE 3055 3. Project & Budget Approv. OE 3123

	Prog. Ref. File	Prog. Descrip.	Local Eval. (AIR Guide)	Pupil Cen. Instru.	CSM	ELSEGIS	CPIR	SEA-MES	Application Proposals/Level
4. Expenditure Rpt. for State Direction & Supervision OE 3056	?	?						?	
5. Cost of occupational Training OE 4000		?						?	
6. Federal excess personnel property available for transfer OE 3126								?	
7. Request for Inventory Adjustment OE 3127								?	
8. Auxiliary List Amendment OE 3128								?	
ESEA 89-750, 90-247,90-576 Title III Adult Basic Education Grants to States Special Projects Teacher Education									1. State Plan OE 3051 2. Fiscal Estimates OE 3052 3. Application for Grant OE 3121, 3121-1 & 2 4. Project Application OE 3120, 3120-1 & 2.
5. Survey of Participants in Adult Basic Education OE 3081		?		?				?	
6. Teacher Training Participants Form OE 3120-3							?	?	
7. Annual Financial OE 3059							?	?	
8. Annual Expenditure OE 3119							?	?	
9. Annual Expenditure OE 3120-4							?	?	
10. Quarterly Program Rpt. LE 3091							?	?	

On the basis of this extremely preliminary analysis, it appears that the large majority of the current reporting requirements of the States to USOE can be included (with some degree of comprehensiveness) in reports to be generated by completion and analysis of the data entries required within the JCES elements. This is actually based on the assumption that the SEA-MES will in fact cover all State management reporting requirements as these were listed in the original table.

JCES Element Redundancy

Following the two analyses of element coverage reported above, an item-by-item analysis of each of the JCES element instruments was performed. The items were then inspected for inter-element redundancy. (The item-by-item listing of elements is included as part of Appendix E.) Although a superficial look at the instruments might lead one to expect many fully redundant items, a more detailed examination shows that the situation is more complicated than that. The analysis showed that although questions may be worded in exactly the same manner on two or more instruments, the reference groups to which they are directed differ. Examples of this situation are discussed below.

Funding - The Project Descriptor Instrument (PDI) asks for the amount of federal funds "requested" and "received" for the current fiscal year by Title. Since the PDI is filled out at the School District level for each specific project separately, the amount of funds relates to one project only. This project may be in operation in one grade level, several grade levels, one school, several schools, all schools, etc. The Pupil Centered Instrument (PCI) District Questionnaire asked about the amount of funds "approved" for current fiscal year by Title. This item may sound the same as the PDI item, but since this item of the PCI is filled out at the District level, the amount of funds relates to all projects in the District under a specific Title. The Consolidated Program Information Report (CPIR) which is also answered at the District level, asks about the amount of funds "expended" (for the former school year) for various types of services and activities by Title in each District. This is a finer breakdown than was called for on the PCI as it reports funds by type of service or activity. From this, it can be seen that these items are not strictly redundant. Additionally, the questions ask for funds requested, received, approved, and expended. These terms are certainly not entirely redundant, although the PDI's "received" might correspond to the PCI's "approved" in some cases.

Impact Area - The PDI asks for the characteristics of the population in an impact area for a specific project. Data on variables such as per capita income, unemployment rate, total population, urbanism, and ethnic or racial group membership are collected. The PCI School Principal Questionnaire asks about the characteristics of pupils and their families in each school, specifically minority group membership, public welfare recipients, parents' education and urbanism of school's location. The PCI Pupil Questionnaire also asks about pupil characteristics. This questionnaire contains items relating to minority group membership, public welfare recipient, language spoken in the home, employment status of parents and family income. Even though these three instruments collect the same type of data, they are not redundant because they are applied to different sets of people (i.e. - project participants, school, population, and class.) Data from the PCI Pupil Questionnaire cannot be summed to yield accurate school information because only a small number of pupils are sampled in each school. Finally, the PDI data and PCI School Principal Questionnaire data do not overlap because schools and projects do not always overlap.

Number of Schools - Both the Pupil Centered Instrument School District Questionnaire and ELSEGIS collect data on the number of public schools in a school district by grade span. The PCI School District Questionnaire asks for the number of schools in each of the following categories: PRE-K, K-3, 4-6, and 7-12. ELSEGIS asks for a finer breakdown, but the information is largely redundant.

School Attendance - The CPIR collects data on public school membership for districts for each grade level from Pre-Kindergarten to Grade 12. ELSEGIS collects data on pupil enrollment in school district for nursery school, kindergarten, elementary, and secondary. This can be derived from the CPIR. The PCI School Principal Questionnaire asks for the average daily attendance and school membership for Kindergarten and Grades 2, 4, and 6. The PCI Teacher Questionnaire asks the teacher to indicate the number of pupils in his class. There is some redundancy here between the PCI Principal and PCI Teacher Questionnaire since the Teacher Questionnaire is administered to all 2nd, 4th, and 6th grade teachers in each sampled school.

Staffing - ELSEGIS asks for the number of instructional staff by type and the number of classroom teachers by highest level of education completed in each district. The Project Descriptor Instrument collects data on the number of personnel by type for each project. This is not a redundancy since the data is collected for two non-equivalent groups.

Instructional Approaches - Both the PDI and the PCI Teacher

Questionnaire ask about approaches to the presentation of instructional materials, i.e., whether a topic, subject matter, unit, skills, or activity centered approach is used. In the PDI, the teacher is asked to describe the individual project with respect to the above, while in the PCI Teacher Questionnaire, the teacher is asked to describe the approach used in math, reading, and language. The question is not exactly redundant since the question is asked regarding two different groups that cannot be equated.

In-service Training - The PCI Questionnaire collects data on the amount of funds and number of personnel by type that are participating in In-Service training programs in each school district. The CPIR collects this same information for each district. This is perhaps the only truly redundant question with respect to both type of information and reference group.

The questions cited above are the only ones in the JCES System that have any redundancy at all. It is clear that not very many items could be eliminated from the present instruments on the basis of redundancy alone without a resultant loss of information necessary according to the original designs for the system development and implementation.

Summary of Element Anayses

On the basis of the findings of the reviews reported above, it appears that the JCES are, in general, both relatively comprehensive in meeting the general evaluation requirements and relatively non-redundant with respect to specific item coverage.

Certain reservations must be placed on this statement, however. First, with respect to comprehensiveness, there is a serious lack in the instrument set at this time because of the non-existence of the SEA-MES. This instrument is intended to provide evaluation data with respect to the management chain functions within the States (and perhaps local) agencies. Since it does not yet exist, the statement of relative comprehensiveness is based on the assumption that the SEA-MES can be developed as a comprehensive instrument which will fulfill its purpose in a satisfactory and complete manner.

Second, also with respect to comprehensiveness of the instruments, an item-by-item appraisal with respect to the evaluation needs is still needed. The estimation of comprehensive coverage of an instrument in relation to the evaluation questions and the reporting requirements were made on the basis of an over-all review of the instruments and their contents. The actual instruments were used in this estimation process, but not on an item by item basis. Therefore, it can not be said that the instruments are totally complete with respect to every possible question which should be asked. However, it may never be possible to say this about any set of evaluation instruments designed for any purpose, and the JCES instruments currently available appear "comprehensive enough" to accomplish a large part of their massive job.

On the question of redundancy, an item by item check and comparison was made across all instruments. Some redundancies were discovered, but only a few. Other items which had initially appeared redundant from instrument to instrument were generally asking for about the same information, but were requesting it from different levels in the management chain of the Delivery System. Thus, little real redundancy exists across the currently developed instruments, and it is not thought to be a serious problem.

SYSTEM REPORTING REQUIREMENTS

This section presents the results of current analyses of the reporting requirements and the data analysis developments necessary to support the developing JCES. Included herein are discussions of the major functions to be served by the information processing portion of the evaluation system, the consumers and their utilization of the JCES and its data, the reporting requirements for consumers, some examples of various report types which might result from the developing report generation system, and a preliminary view of the data analysis plan necessary to develop the detailed reporting requirements and the specific data sets necessary to provide the outputs.

System Functions and System Reports

Each agency in the management chain has several major functions which must be carried out and reported on: it must function as a grantor; as a monitor of projects funded under the grants; and as an evaluator of the effectiveness of the program. Each agency must also function as a reporter of the effects to higher levels to the Congress, and to the general public.

As (an example of) a grantor, BESE make funds available to States and local school systems. Funds can be made available in a general non-categorical format or with categorical restrictions on utilization. In the former case, attempt is made to assess the impact of the additional money on the program and the granting agency (SAFA is a good example) uses relatively simple criteria to determine the needs of the local education agency. Under other Titles/Programs, the agencies are required to assess the equity of the allocation of grants. Under some title, monies must go to specific area of educational need according to the level of need (Title I grants to local education agencies is a good example). In other cases, specific target populations or types of programs must receive the aid.

The JCES will serve these needs by collecting statistical information concerning the areas of relative educational need through the CPIR and SEA-MES. The resulting information will be used to determine both the equitability of grants allocations and the budgetary requirements for the future.

Each agency must monitor its activities also and must collect data on its day to day performance whether at USOE, SEA, LEA, or local school levels. These data must be related to the management effectiveness of personnel within the agencies as well as to information on program effectiveness in the substantive programs taking place in the schools. Both management performance reports and program performance reports should be available and should be related to other statistical information in the JCES. Field reports of monitors should be included also as a retrievable part of JCES. These would include reports of visits to various education agencies to corroborate reports of management effectiveness submitted to the JCES.

JCES is also designed to assist each agency's operation as an evaluating agency. Several major areas of evaluation can be identified. The first of these has to do with the direct observation of the operating agency, itself. This is viewed as a self-evaluation of management effectiveness. Thus, the JCES must provide a tool for Program Managers, Administrators, Agency Chiefs, and Grants Managers to use in examining their own performance, identifying areas of need, and defining remedial action. A second kind of evaluation concerns the evaluation of each stage of the delivery system and involves regional interests, state education agencies, local education agencies, and frequently, sub-divisions within the local education agencies having program decision responsibilities but not engaged in educational services. Development of an adequate evaluative pattern for this complex delivery system will be a major goal of the present effort.

Finally, each agency must serve as an evaluator of substantive programs carried on in schools by real people working with real children. The task is difficult but the broad outlines of evaluation of this form of activity have been laid down. Information is collected concerning the relative level of skill, abilities, etc. of the recipients of the service; a specified treatment or activity is carried out; the subsequent levels of the skills and abilities are related to the earlier measurement; and the program is "measured" in terms of the improvement or change which occurs in the recipients. Information for reports of this type must also be collected in JCES.

System Output

Output Users

On the basis of the above designation of the Delivery System and JCES interrelationships, the following is a list of the most likely consumers of the JCES output reports:

1) Congressmen, who want to know what the money has been spent for and what effects have resulted;

2) Agency Managers - at all levels: Federal, State, and Local - who want to know what their agencies have accomplished and how well it has been done;

3) Grants Manager - again, at all levels - who want to know just how the money has been disbursed, for what and under what conditions it is being applied;

4) Program Administrators - at all levels - who want to know what has been done within both funding and substantive programs, and what effects the efforts have had on the intended target groups;

5) Research and Evaluation Personnel - both within and outside the Federal/State/Local chain - who want to know what is going on, who is being served, by what kinds of programs and projects, and under what

conditions; also are concerned with the effectiveness of which programs in terms of what level of effects can be observed under which of the combinations of initial conditions and Project applications;

6) State and Local level Adminstrators (CSSO's and Superintendents), who want to know how well their State or Local schools and students are doing in relation to other States, etc., and in relation to expenditures under the various Federal and State funding programs;

7) The educational and general public, who are interested in the educational progress in schools and also in the relative costs expended to achieve given degrees of excellence, as well as in the questions as to which kinds of educational programs actually produce results in the schools.

Probably there are other potential users of the system outputs, but this partial list will suffice for the moment, since it indicates a broad scope of interests and a broad set of outputs required to meet these interests.

It should be pointed out that the major users both in number and frequency of usage will be the management and evaluation personnel within each level agency related to the JCES. This means that the major outputs of the system will be those required by the Agency Managers, the Program Administrators, the Grants Managers and the Research and Evaluation personnel at each level of the system's operation. Although all of the users identified above will use some of the outputs of the system, it is these latter persons who must be satisfied in the initial development of the reporting subsystem of the JCES. It appears that the reporting requirements of these personnel can be satisfied through a combination of statistical (descriptive), fiscal accounting, and evaluative reports centering on the program processes and the products of the substantive projects in the schools. Some characteristics of the report types these personnel will require are discussed next.

System Reports

When the work "report" is used about a management activity such as the Delivery System (from Congress, through the Secretary and Commissioners of BESE and hence to the SEAs, the LEAs, and individual school programs or projects) we must define our meaning carefully. Reports of varying levels of specificity and purpose range from visitation reports from monitors to annual reports published by the Secretary of HEW. They can vary in form from a single sheet of figures entered in a quarterly fiscal report to a comprehensive source of detailed fiscal data, such as the SAFA Annual Report.

A complication here is shift in the perception of a report which occurs when it leaves the reporting agency and travels to the receiving agency. Materials traveling upward in the system are throught of as reports by the initiating agency. But, the receiving agencies may consider these to be items of data to be entered into their own report generating system. That is, they view incoming reports not as reports at all, but as "statistical bits" to be entered into their files.

This same shift in the meaning of the work report can take place within USOE. For example, incoming information from the field is used to create a file from which a "report" of grants approved, children served, or monies expended can be generated. However, once this "first stage report" comes into being it, in turn, becomes a resource unit in a larger process: that of generating annual reports or dissemination documents. These aspects of "reports" must be considered in the further development of the report generating system within the JCES.

Report Types

The reports to be generated by the JCES can be categorized along several conceptual dimensions. For example, there will be reports which serve the needs of individuals or small groups of persons and other reports which will be widely circulated to large number of persons.

Report can also be categorized along the dimension of numerical versus narrative. Some reports will consist almost entirely of statistical and fiscal data organized in numerical tables with no significant amount of verbal explanation. Other reports will contain largely narrative and interpretive information and depend only in minor ways on the use of statistical or fiscal information. Finally, many reports will be hybrids, with considerable amounts of narrative or interpretive writing to support and call attention to the statistical information.

Reports can also be categorized according to the purposes to which they will be put: administrative and management decision-making; reporting to Congress and the public; development of legislative proposals and budgetary requests; dissemination of information concerning exemplary projects and effective approaches to local schools; etc. Some of these are described briefly below.

Individual Reports: Feedback to States, etc. - The information available in the data base of the JCES can be made useful to individuals and small groups at various levels within the overall Delivery System. A significant aspect of the JCES plan is a cooperative relationship between the states and the Federal government. In order to reduce the number of reports flowing from the LEAs and SEAs to the Federal level, a system of comprehensive reports is under development to significantly reduce the total number of forms required under the various programs at the local and state levels. At the same time, consideration is being given to the information needs of the states. Thus information generated at any level can be moved to higher levels where it can be merged and manipulated to provide the required information for Federal purposes. At the same time specific summary printouts by State and/or District can be derived and returned to the States and Districts for their use; thereby avoiding duplicated effort in the collection and processing of information. Thus, a major function of the JCES reporting activity will be the provision of appropriate statistical printouts for the individual States or Districts. Such "reports" will be in the form of individualized data printout designed to meet the needs of single managers or evaluators or a small group of decision makers within a branch.

Inquiry Concept Another form of individualized report will be produced by the JCES is response to "one-of-a-kind" requests. An important part of development of the JCES capability is the development of a methodòlgy for prompt and appropriate information retrieval (or generation) "on demand." This information retrieval capability should not be limited to a simple "drawing account" for "statistics". The inquiry capability must provide for data manipulation as well.

The inquiry system will permit managers and administrators to interface with programmers and researchers to formulate specific questions that can be addressed to the JCES. These questions might be developed in response to special calls, legislative calls and budget calls received by the Bureau. A well designed inquiry system can also serve more general needs: it can identify the frequently-asked questions and thereby perform two functions

a) provide regular reports on these questions or issues.

b) identify areas of congressional or Bureau concern and interest which warrant re-examination and the possible generation of legislative proposals.

The proposed inquiry system represents a powerful instrument, therefore, in the generation of special reports in response to special calls, budget calls, and legislative calls.

Published Reports - Several major classifications of published reports can be identified. Some are periodic and repetitive in nature (the SAFA, NDEA and, more recently, the ESEA Survey Reports, are typical of these repeating or serial reports). Other reports grow out of the continuing interest of the Bureau in specific areas of educational activity or practice. Some examples are: the Public School Finance Report, the Educational Directory of States (mandated, but format varies from year to year), the Handbook on Exemplary Practices, etc. These reports draw upon, but are not directly derivative from, the types of information to be available in the JCES. Taken together with the legislative review reports mentioned above, they can constitute the general system of reporting available at present.

Another form of published report which may be generated from JCES statistics will be reports focused on the special target groups. Such reports would identify the multiple impact of various legislative titles on a specific group of persons (for example, migrants, dropouts, etc.). Such reports would also focus on educational sub-groups and report the impact of multiple programs.

Report Specifications

The following Exhibits (11a through 11g) present some preliminary specification for some of the reports to be generated from data derived

EXHIBIT 11-a

SPECIFICATION FOR:
USERS DATA SHEETS: MANAGEMENT

Audience:
Program and Grants Managers in Federal, State and/or Local Agencies who need aggregated data concerning their level of interest. OE-BESE will work through the Belmont Group to determine all persons or job titles by whom such information will be required.

Authorship:
To be generated directly by JCES Data System On Request or as Routine Request. Specific data content will be defined by persons at each level of interest.

Content:
These reports will be in the form of data printouts. They may merge data from the LEA's or the States to form statewide or National counts, tallies and other cumulative indices, as required by the level of interest.

Some cross-tabulation, or inter-action of variables information will be available to managers through this feedback system. Statistics will more usually be actual counts, percentages and averages.

(Analyses or data base queries of a more complex nature will be requested through the inquiry system. Frequently-requested inquiry items may then become parts of the regular feedback system. Infrequently requested data manipulations will be dropped from system.)

Next Steps:
Sit with Agency Managers, Program Administrators, Grants Managers, Fiscal Officers of typical programs at each level to work out the format and data contents most appropriate for

EXHIBIT 11-a(continued)

title with which they are concerned. Concentrate on data needed for effective management as opposed to data required for published reports. Prepare Mock-ups of Printouts for evaluation and approval by division and branch managers.

EXHIBIT 11-b

SPECIFICATION FOR:
GRANTS MANAGEMENT INFORMATION REPORT

Audience:
SEM or USOE Grants Managers and Agency Managers, Congressional Committee Members, and Committee Counsel. Other persons interested in the general problem of disbursing funds through State Coordinating Agencies to local users of funds. The reports should indicate where bottlenecks are occurring, where unspent monies are accumulating, where "feast/famine" conditions are occurring, or where cycles of fund disbursal are conflicting or out of phase with funding needs, etc.

Authorship:
Prepared (using Functional Users Data Sheets) by responsible SEM or USOE divisions and branches concerning their own grants management program.

Content:
Focus on Funding programs (perhaps across programs).

- Amounts of money allocated (deliveries)
- Funds remaining (inventory)
- Grants and Proposals processed
- Applications received and processed by SEA's
- Evaluation of Application (sales)
- Decision making speed
- Re-allocation cycle
- Management services provided
- Personnel resource allocation problems
- State and Local Management allocation problem areas

Next Steps:
Work with title coordinators to develop standard table of contents and report format.

EXHIBIT 11-c

SPECIFICATIONS FOR: PROGRAM ADMINISTRATION REPORT

Audience:

A report useful to managers at SEMS and USOE to share information on the goals, problems, thrust of each program; useful to Congress, especially members of the House Education and Labor and the Senate Labor and Public Welfare Committees, in hearing from administrators how the intent of congress is being carried out, how local area needs are being met, what legislation is needed, etc. And useful to the educational publics (i.e., NEA, NAVA, etc.) in helping them develop an understanding of the programs, policies, problems, etc. that are associated with the program.

Separate Program Reports are to be prepared for each Title or related cluster of activities.

Authorship:

Prepared by individuals responsible for Grants Management/Program Administration within a specific title area. Summaries of data as required can generated directly by the JCES Data System.

Content:

Each report focuses on one Congressional Mandate and reports the degree of success of the manager of that program in meeting the intent of Congress. Each report presents JCES data which help to:

Report implementation of programs
Monitor conduct of programs
Indicate program success
Indicate project successes
Spotlite weaknesses in current programs
Indicate needs for new programs
Show whether present funding levels are adequate
Indicate if program is missing target population

This report could become a valuable resource during annual reporting to Congress and to the President. It serves as a

EXHIBIT 11-c (continued)

This report could become a valuable resource during annual reporting to Congress and to the President. It serves as a vehicle for converting JCES data into legislative recommendations, support of continuing programs, and for presenting plans for reallocation of effort from one area to another, etc.

Next Steps:
Discuss published report needs with persons responsible for program administration and offices, prepare draft "table of contents" for sample report.

EXHIBIT 11-d

SPECIFICATIONS FOR: MANAGEMENT PROCEDURES DISSEMINATION REPORT

Audience:

A report useful within OE as a device for defining management activities, methods, procedures and useful to SEA and LEA program managers to clarify how management information of the type generated by the LEA can be used at federal, state, and local levels to strengthen management; can be used for training and development of management and evaluating personnel at OE, SEA and LEA levels; and useful with Congress and the educational public to show how effective management principles are being "required" by the JCES.

Content:

This report (probably broken down into a series organized by program) would relate the CESystem to the management technique or system. Some of the possible areas of focus would be:

- Paper flow and Documents used
- Accounting:
    - Cost
    - Pupil
- Procedures at:
    - SEA levels
    - LEA levels
- Training and Staff Development
- Reporting Techniques (uses for data at SEA and Lea levels - school boards and public)
- Efficiency Measurement

These reports would also interpret to LEA and SEA managers the impact and uses to which they can put the JCES data for their state or local area. They would also serve as models for within-state paper-flow charting and encourage improved management planning at SEA and LEA levels.

EXHIBIT 11-d (continued)

Next Steps:
Develop a clearer picture of the needs of member states in the way of Management Information and Development; prepare outlines for specific titles in the Management Information Report Series; work with existing materials showing paper flow and approval structures within the OE.

EXHIBIT 11-e

SPECIFICATIONS FOR:
EVALUATION REPORTS: TITLE-BY-TITLE

Audience:

Useful with Administrators, Congressmen, as a device for interpreting the purpose, intent, goals, degree of success, types of approaches, etc. that are associated with the particular TITLE reported upon; useful with project officers and professionals within LEA's and at the school level to show them (by inference) how they compare with other projects under same title; shows them where they stand; what to aspire to, etc.; also for public dissemination and to ERIC.

Content:

These reports would provide specific, detailed statements of the costs/benefit associated with the Title Program being reported. Characteristics of typical programs; characteristics of unusually successful programs; and characteristics of unusually weak programs would be reported.

These reports would focus on Title programs. They might be broken down along such lines as:

- Recipients - percent reached; intensity of service, pupil hours, etc.
- Services - content, techniques, approaches, etc.
- Materials - equipment, tests, community resources, etc.
- Staffing - types of people, roles, man-hours, etc.
- Costs - actual, attributed, etc.

Some special problems associated with specific titles, would be covered in this series. An example is the problem of identifying schools with exceptional educational need for Title I monies. The new JCES data may provide information for better distribution of funds.

EXHIBIT 11-e (continued)

Next Steps:

1. Prepare "Table of Contents" for each of a proposed list of "Title Evaluation Reports".
2. Review concept and contents with OE title coordinators.

EXHIBIT 11-f

SPECIFICATIONS FOR:
EVALUATION REPORT: TARGET GROUPS

Audience:
Useful with Congress and Educational Publics to show how actual progress is being made with specific populations (i.e., degree to which needs of East Coast Migrant Stream children are being met) and to solve specific problems (re: Identification of Methods used to raise reading scores of children in all programs), Useful for representatives of minority group populations to provide measures of progress and with specific educational public and general public (i.e., Remedial Reading Teachers) to show the relative value or effect of various techniques or approaches.

Content:
This series of reports would focus on the specific target populations and educational goals mandated by all the various legislative titles. Some would concern themselves with pupil progress; i.e. changes in attitude toward learning, improvement in reading scores, better attendance records, etc. Evidence of such changes would be cited, within and across titles, and specific correlative factors would be cited where possible (i.e., correlation between breakfast and attendance; reading material type and reading score gains, etc.)

Such reports would also attempt to determine the combined effect of multiple programs on populations of children with a common need.

Next steps:
Prepare list of possible titles using the titles and output chart; work up sample report; develop priorities among proposed reports; Review concept within OE.

EXHIBIT 11-g

CONTENTS OF REPORT BY TARGET GROUPS (EXAMPLE)

Report of Services to Disadvantaged

A. ESEA Services
   ESEA I General Aid Program
   ESEA I Granted Project
   ESEA III Supplementary Services
   ESEA VII Bilingual Disadvantaged
   ESEA VIII Disadvantaged Dropout

B. OEO Supported Disadvantaged Follow Through

C. Vocational Services:
   Vocational Education Research Projects
   Smith/Hughes Grants Projects
   George/Barden Grants Projects
   Vocational Education Act '63 Support
   Work Study Program Support
   Residential Vocational Education Aid

D. Summary: Combined impact of Services to Disadvantaged Children from the JCES. These begin with a specification for the Special Purpose Data Sheet report type, Exhibit 11a which would consist of raw or merely summarized data drawn directly from the JCES data base, to be disseminated directly to the requestor (or routine recipient, if pre-defined) at which ever level required. This type of data sheet report could be generated directly by the JCES when data become available or on request if a non-routine request for special data. Both data contents and formats will have to be developed for what will probably be a large number of such data sheet reports. These can only be defined by the specific users, and this development will require a large amount of effort.

Other preliminary specifications presented below are for reports defined as:

1. Grants Management Information Report (Exh. 11b)
2. Program Administration Report (Exh. 11c)
3. Management Procedures Dissemination Report (Exh. 11d)
4. Evaluation Reports: Title - By - Title (Exh. 11e)
5. Evaluation Reports: By Target Groups (Exh. 11f)

An example of the possible content of a report of this last type is shown as Exhibit 11-g. This is an extremely preliminary set of specifications and will be revised and extended in later studies of the specific report needs.

The process of development of more detailed report specifications is actually the first step in the development of the Master Data Analysis

Plan and is discussed in some detail in the next section.

Master Data Analysis Plan: Development Requirements

The heart of the JCES's capability to produce the various reports of statistical, fiscal and inter-related data from the various instruments of the system will be the detailed data analysis plan to be developed. Only through efficient planning and detailed specification of data manipulation and data relation requirements can the plan and the system be efficient in rapid and accurate production of data reports of any kind from the JCES data sets. This section does not develop the Master Data Analysis Plann required for this purposes; it simply defines some of the required characteristics of such a comprehensive plan and outlines the developmental steps necessary to its design and completion.

Data Analysis Plan Requirements.

Any efficient data analysis plan must perform several specifiable operations or tasks to prepare to yield the desired products. It must:

1. Identify the output information requirements of each defined analysis process or requirements - that is, specify the information products required for each analytic step.

2. Identify and isolate each data element (item response) involved in the information requirement for the output - that is, locate and store for ready retrieval each element required to enter into the product.

3. Identify and specify the combinatorial or computational steps necessary to turn the data elements into output information elements.

4. Define the exact processes for manipulation of the combined data and preparation of the output information in the desired formats, etc., for the initial requirements.

The JCES Master Data Analysis Plan (MDAP) must accomplish these same steps, but instead of defining these for a single set of data elements (item responses), it must consider interrelationships of the data sets derived from the separate instruments, as well. This will require a more extensive job of data identification (Step 2) than might be requred for a single instrument analysis plan. However, this is largely an enlargement of the normal process of Step 2 and is entirely dependent upon the successful accomplishment of Step 1 - the successful identification of the exact information required for the product. When the detailed products have been specified, the analyses to determine data element identification and manipulation requirements (Steps 2 and 3) become relatively direct processes; although the selection of specific analytic techniques and the determination of data utilization can both become difficult, time consuming activities. This is also true for the manipulation processes for producing a report from the combined data elements.

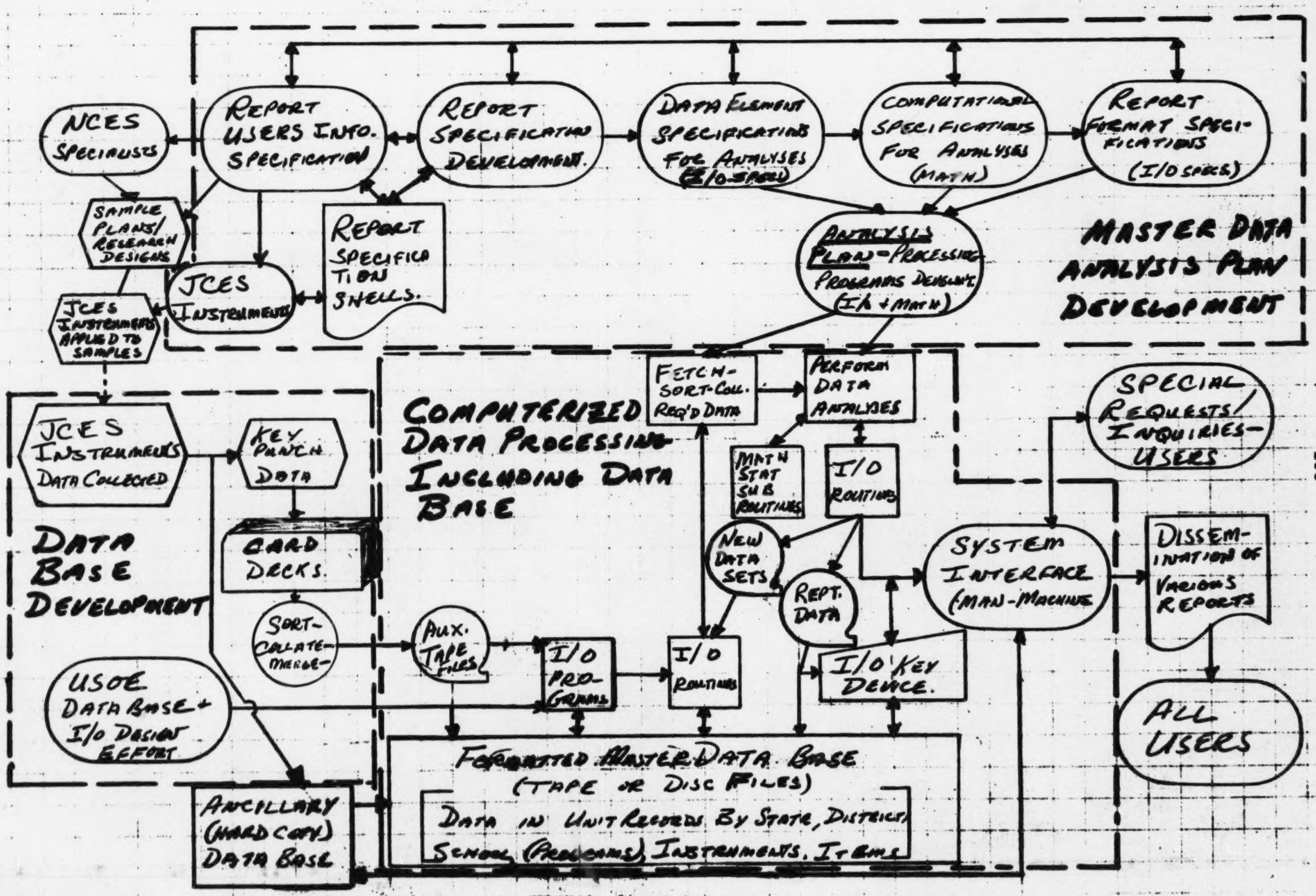
Development of MDAP for JCES

Before detailed discussion of the development of the MDAP an overall view of the expected relationship between the MDAP and the required JCES data processing system should be examined. Exhibit 12 presents such a view, showing the MDAP (and its developmental steps) in direct relationship to a postulated JCES information system. The Exhibit shows the basic Data Base Development occurring at the left of the diagram, with data input from the JCES instruments being converted to punch cards and merged into tape files which would then enter directly into the formatted Data Base. Some collected data, such as narrative reports not easily processed into the main data base, would be shunted to an ancillary data base for later availability to evaluation or other users, either within or external to USOE. The main formatted data base would become the reservoir of all numerical or categorical data inputs from each major JCES instrument. This reservoir would then form the basis for all report generation activities through the System Interface shown to the right of the Computerized Data Processing section of the Exhibit.

Report generation (other than raw data dumps) would always involve the application of the Master Data Analysis Plan, shown at the upper part of the Exhibit. The MDAP will serve the major function of director, or data analysis executive, for all data manipulation and reports generation by the system. Whether the MDAP becomes computerized or not will depend largely upon the data processing system design approach. It could be developed as either an on-line or off-line portion of the computerized system. In either case, its influence must be the same, only the personnel required and the actual operations would be different (that is, both programmers and research analysts would be required in the computerized version whereas only the research analysts might be needed for off-line operation.) This influence of the MDAP is indicated in the Exhibit at the interface between the MDAP Development block (top) and the Computerized Data Processing block. This indicates that the Analysis Plan will (either directly or three programmers) direct the input-output (I/O) operations of the computer as well as the specific statistical computations to be performed on data elements, also specified by the MDAP. It should be noted that this data processing system conceptualization is based on preliminary data and primarily those related to instrument processing, analysis requirements, and reports requirements.

The performance of the four steps listed earlier for MDAP development are indicated by the five bubbles at the top of the upper block of Exhibit 12. These are shown as: the interactive determination of information requirements for report specification development, with the interaction being between the report users and the analysts (Step 1); the development of data element specifications to meet the information needs of the report specification(s) (Step 2); the specification of the mathematic and statistical computational/analystic procedures necessary to convert the data elements to the required informational forms (Step 3); and, the

EXHIBIT 12: MASTER ANALYSIS PLAN AND DATA PROCESSING SYSTEM

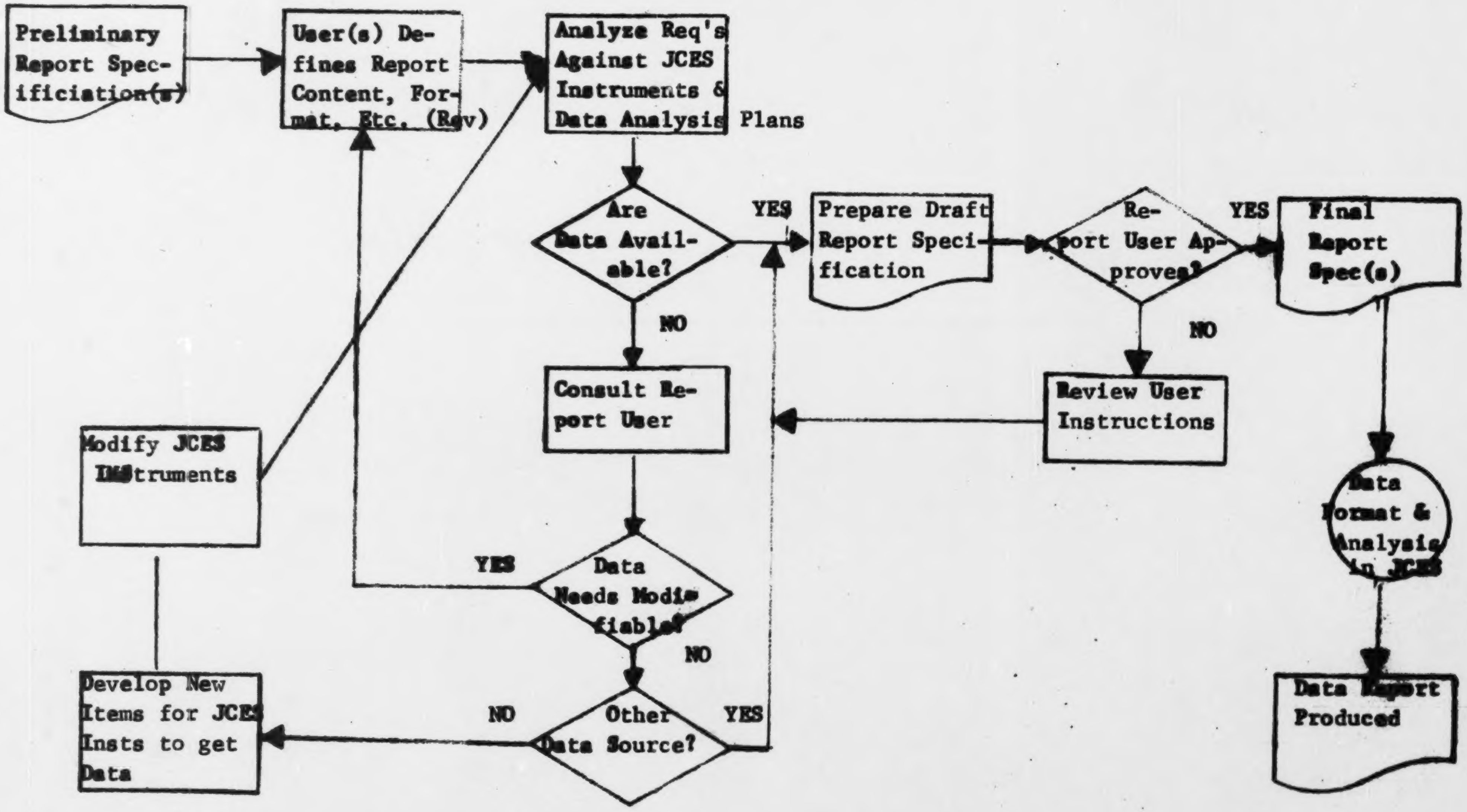

NCES SPECIALISTS
REPORT USERS INFO. SPECIFICATION
REPORT SPECIFICATION DEVELOPMENT.
DATA ELEMENT SPECIFICATIONS FOR ANALYSES (I/O SPECS)
COMPUTATIONAL SPECIFICATIONS FOR ANALYSES (MATH)
REPORT FORMAT SPECIFICATIONS (I/O SPECS)
SAMPLE PLANS/ RESEARCH DESIGNS
JCES INSTRUMENTS
REPORT SPECIFICATION SHELLS.
ANALYSIS PLAN—PROCESSING PROGRAMS DESIGN. (I/O + MATH)
MASTER DATA ANALYSIS PLAN DEVELOPMENT
JCES INSTRUMENTS APPLIED TO SAMPLES
JCES INSTRUMENTS DATA COLLECTED
KEY PUNCH DATA
CARD DECKS.
SORT-COLLATE-MERGE-
DATA BASE DEVELOPMENT
USOE DATA BASE + I/O DESIGN EFFORT
ANCILLARY (HARD COPY) DATA BASE
COMPUTERIZED DATA PROCESSING INCLUDING DATA BASE
FETCH-SORT-COLL. REQ'D DATA
PERFORM DATA ANALYSES
MATH STAT SUB ROUTINES
I/O ROUTINES
NEW DATA SETS
REPT. DATA
AUX. TAPE FILES
I/O PROGRAMS
I/O ROUTINES
I/O KEY DEVICE.
SYSTEM INTERFACE (MAN-MACHINE
SPECIAL REQUESTS/ INQUIRIES-USERS
DISSEMINATION OF VARIOUS REPORTS
ALL USERS
FORMATTED MASTER DATA BASE (TAPE OR DISC FILES)
DATA IN UNIT RECORDS BY STATE, DISTRICT, SCHOOL (PROGRAMS), INSTRUMENTS, ITEMS

design and specification of report formats to meet the users' specifications (Step 4).

Performance of these four steps through interactive consultation with the report users will accomplish the major development of the MDAP. The actual iterative process for performance of Step 1 will be discussed in detail to illustrate the approach. Since the data outputs of each analytic process will be the information requirements for a given data report, the iterative process illustrated in Exhibit 13 will define the products of the analysis as well as the detailed information requirements for each report. The Step 1 process starts with report specifications such as those presented in preliminary form in the last section and carries out a series of iterative steps to obtain detailed specifications. As indicated, the first step is to review the preliminary formats and proposed information contents with knowledgeable report users in USOE/BESE and with some of the State representatives of the Belmont States. This is intended to determine the exact information requirements for the various reports, the desired formats, and the frequency of reporting to be required for each type. When the report user has defined these exact requirements, the analyst must consult the JCES instruments and the data analysis plans to determine whether the report requirements can be met. If so, the analyst would then prepare a series of draft report formats and consult with the user until the final draft were approved. This final draft would then be made a part of the JCES data processing specifications and could be programmed for production runs as required. If the data

EXHIBIT 13

ITERATIVE ANALYSIS: REPORTS SPECIFICATIONS DESIGN


Preliminary Report Specificiation(s)
User(s) Defines Report Content, Format, Etc. (Rev)
Analyze Req's Against JCES Instruments & Data Analysis Plans
Are Data Available?
YES
NO
Prepare Draft Report Specification
Report User Approves?
YES
NO
Final Report Spec(s)
Review User Instructions
Consult Report User
Modify JCES INStruments
Data Needs Modifiable?
YES
NO
Other Data Source?
NO
YES
Develop New Items for JCES Insts to get Data
Data Format & Analysis in JCES
Data Report Produced

were not found to be available or producible within the currently planned data collection and analysis, the report user would be consulted to determine whether the specifications could be modified; if so, a modified report would be drafted and eventually approved by the user. If the report specifications could not be modified, other data source would be checked for the requirements of the user; if found, these data specification generated as above. If no other data source were found to meet the requirement, the JCES instruments would be revised (after the usual requirements of forms clearances, etc.) and the report specification and final formats would be derived through iterative consultation with the user, as above.

For simple data sheet reports, this process is seen to be fairly simple, given that the needed data are being collected in existing JCES instruments; but for more complex reporting requirements, involving detailed analyses or interrelations of several kinds of data, the report specification development may be rather difficult and time consuming. For management data, the modifications to instruments might be considerable efforts, also. Or they might force more frequent collection of some data types, with more applications of the relevant instrument to the population of concern.

In any case, this iterative process will allow final detailed specifications for all required reports to be developed. These specifications will actually contribute as weel to the final development of both the

MDAP and the report generation system.

This iterative process will partially accomplish the Step 2 effort also, since the examination of the individual instruments' item contents and responses will generally define the data elements entering into the product. For a simple data tabulation or cross tabulation, this iterative process will entirely define the data elements required. For more complex analyses, the report information products will imply all the elements involved and the examination of the instruments will lead to exact specification of these through an iterative process similar to the above. Report specifications will also be the basis for specification of the combinatorial/computational manipulation of data in Step 3, and the format specifications will imply the manipulative requirements of Step 4. Each of these steps must be laid out in detail prior to further development of the MDAP. However, the basis approaches described here will be followed throughout further work on the MDAP. A major assist to this process will be derived through incorporation of some current detailed analysis plans for the individual instruments (e.g., Dyer & Fortune Plans for PCI-1969 version.)

Some Preliminary Data Processing Consideration

The preliminary data processing system depicted in Exhibit 12 above, is an extremely preliminary concept. However, it is based on current knowledge of the JCES instruments, implementation plans, multiple user requirements, etc., and therefore has some relations to reality; how much remains to be seen. This development and consideration of the data processing system's potential operations have led to additional consideration of a set of possible difficulties or at least decision points which must be passed prior to actual system development and implementation.

First, it appears obvious that the reports generation required of this system dictates a rather large data storage processing, and analysis development. This is indicated by the extent of the data accruable within the system in a single year, alone. However, the potential size of the data bank to accrue over years of instrument application, (as is required for sequential analyses of Program activities), will be much more extensive. When this requirement is considered together with the time limitations which are currently imposed for deporting on evaluation of Programs to Congress, this implies a highly sophisticated and highly integrated data processing development. This is especially true if frequent requests are anticipated processing development. This is especially true if frequent requests are anticipated to be put to the data bank, and if these cannot be predefined so as to ease the burdens of "data spinning" necessary to obtain selected data bits within a large data base. This latter point refers mostly to the "inquiry" capability, discussed under reports. Such a development would allow the research and evaluation personnel, as well as all managers, to enter the data base with specific questions which were not predefined as necessary outputs and to obtain the data requested without weeks of delay due to special programming requirements. While this and similar types of data availability are highly desirable, there is a real question of developmental time and costs as to whether these techniques should be incorporated into the JCES development.

Another major consideration related to this data system development was obliquely referred to above - the frequency of reports generation to meet the defined requests. Since most instruments will be applied only annually (or less frequently), this may be a determining factor. But if the SEA-MES is to operate to provide management information outputs to the SEA's and LEA's which are current and therefore meaningful, the frequency of such report generation probably should be quarterly, and perhaps even more frequently. Management information gets old and "cold" rapidly, and such information may be of very little value a year after the facts. The volume of such outputs must be considered also, since if data sheets are to be provided to 20,000 LEA's on a quarterly basis, this is rather large data output, and should be processed differently than an output of a few hundred printed sheets once or twice a year would be.

A third consideration is the actual degree of "built-in" statistical sophistication which is desired. A highly sophisticated statistical analysis program can be easily handled within the machine capability of the current USOE/OMI IBM System/360 machine. But the combination of sophisticated statistical capabilities together with large data bank requirements poses somewhat different and more extensive (and expensive) system developments.

Unfortunately, there are no answers currently available for the questions raised in these considerations. They must be answered through further analysis of the detailed data requirements and of the desired of the USOE and the Joint Task Force with respect to sophistication and rapidity and frequency of reporting. They are raised here only because they must be answered, along with many other questions, prior to final specific data system definition and specification.

JCES PROPOSED IMPLEMENTATION

The JCES is to be implemented over the next several years with individual instruments already in effect and others to be developed and installed within the next school years. This section discusses the proposed implementation plans and the requirements for the organization and manpower required to accomplish this. It also discusses the proposed development of research/sampling designs conducted to this point.

Scheduled Implementation

The planned implementation of the various components of the JCES is summarized in Table 1 and discussed below. In the Fall of 1969 the CPIR was administered to collect Fiscal '69 data. This administration was made in all 50 states. In the Spring of 1970 the Elementary Pupil Centered Instruments will be administered to collect data on the '69-'70 school year to grades 2, 4 and 6 in all states. It is also possible (low probability) that the elementary level Common Status Measures will be administered in grade four only.

In the Fall of 1970, the elementary/secondary Project Descriptor Instrument will administered, collecting data on the school year of 1970-71, and this administration will be only to the Belmont states. Also at this time, the CPIR will be re-administered to collect data for fiscal year '70 in all 50 states, and the Common Status Measures are scheduled for administration in the Belmont states for grades 4 to 11 (again perhaps doubtful). Finally, the Project Reference File questionnaire will be administered in the Belmont states, if it is possible to add these two questions to the National Center for Educational Statistics standard questionnaire. If not, it may be necessary to administer these two questions separately.

In the Spring of 1971 the Pupil Centered Instruments are tentatively scheduled for administration although it may be decided that these instruments will be administered biennially instead of annually. If administered they will be given to grades two, four, and six in all 50 states covering the 70-71 school year. Common Status Measures (elementary and secondary) are also scheduled for administration in the Belmont states. For the Fall of 1971 the schedule for administration is the same as it is for the Fall of '70, and in the Spring of '72 the schedule is the same as the Spring of '71 with the addition of the secondary level Pupil Centered Instruments, grades 9 and 11, in the Belmont states only.

TABLE 1

IMPLEMENTATION SCHEDULE FOR JCES

Time	Instrument	Sampled Group
Fall 1969:	CPIR	50 States
Spring 1970:	Elementary Pupil Centered (FY 69-70)	Grades 2,4,7; 50 States
	Common Status Measure	Belmont - Grade 4*
Fall 1970:	Project Descriptor (FY 70-71)	Belmont
	CPIR (FY 70)	50 States
	Common Status	Belmont - Grades 4 & 11
	Project Reference File	Belmont***
Spring 1971:	Common Status	Belmont - Grades 4 & 11
	Elementary Pupil Centered** (FY 70-71)	50 States - Grades 2,4,6
Fall 1971:	Project Descriptor (FY 71-72)	Belmont
	CPIR (FY 71)	50 States
	Common Status	Belmont - Grades 4 & 11
	Project Reference File	Belmont***
Spring 1972:	Elementary Pupil Centered	50 States - Grades 2,4,6
	Common Status	Belmont - Grades 4 & 11
	Secondary Pupil Centered	Belmont - Grades 9 & 11

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* There is still some question about the administration of these.

** A decision may be made to make the Pupil Centered Instrument biennial: this would then be postponed to 1972.

*** Some parts of this file are derived from the NCES Universe file covering all 50 states.

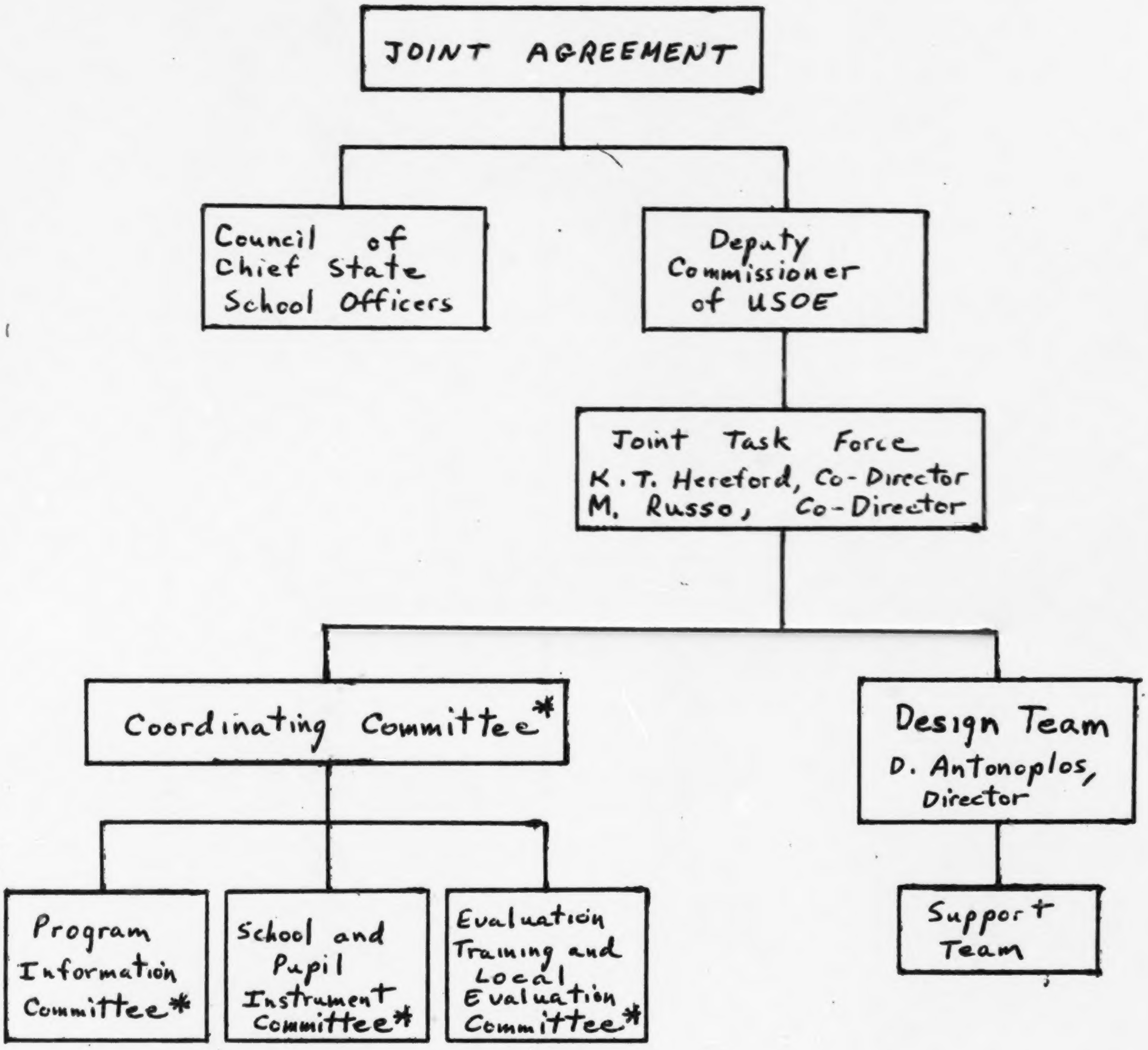
Belmont Working Organization and Staff

The Belmont JCES working organization is shown in Table 2 . Karl T. Hereford and Michael Russo, both of U.S.O.E., are co-directors of the Joint Task Force, members of which are shown in Table 3 . The design team is directed by Daniel Antonoplos of O.E. Its membership is shown in Table 4 . Table 5 shows the Support Team. The Coordinating Committee is headed unofficially by Mr. Charles Nix of Texas. Under this are three working committees each chaired by a representative from one of the States and composed of both federal and state personnel.

The Program Information Committee with Mr. Jess Elliot of Georgia as chairman is concerned with the consolidation and improvement of the system for reporting the statistical information required by the multitudinous pieces of legislation covering the activities of the O.E. Bureaus. The Consolidated Program Information Report (CPIR) was developed to make it possible to report on one set of forms information concerning the flow of dollars to services and to target groups from several legislative funding sources. The CPIR will eventually allow for the collection of information at the district level which will show the impact of the flow of dollars by source and the flow of services to the various target populations. The target populations will then be the primary unit of analysis for the interpretation of the data.

TABLE 2

JCES WORKING ORGANIZATION


JOINT AGREEMENT
Council of Chief State School Officers
Deputy Commissioner of USOE
Joint Task Force
K. T. Hereford, Co-Director
M. Russo, Co-Director
Coordinating Committee*
Design Team
D. Antonoplos, Director
Program Information Committee*
School and Pupil Instrument Committee*
Evaluation Training and Local Evaluation Committee*
Support Team

* Composed of both Federal and State personnel.

TABLE 3

JOINT TASK FORCE

K. Hereford, Co-Director

M. Russo, Co-Director

E. Crawford

F. Harrison

L. LaMoure

A. Lichtenberger

G. Mayeske

L. McGuinness

N. Pitts

D. Rose

K. Wallman

K. Willis

TABLE 4

DESIGN TEAM

Daniel Antonoplos, Chief Evaluation Design

Consultant Staff:

- Henry Dyer, Educational Testing Service
- Gene V. Glass, Laboratory of Education Research
- Bob Hammond, Ohio State University
- Robert Heath, Stanford University
- Gerald C. Helmstadter, Arizona State University
- Phillip Kearney, Michigan
- William Maddow, Stanford University
- David Orr, Scientific Educational Systems
- Robert Stake, CIRCLE
- Dan Stufflebeam, Ohio State University
- Willavene Wolf, Ohio State University

Office of Education Staff:

- N. Bradley
- C. Hammer
- I. Lipkowitz
- S. Smith
- L. Tomic

TABLE 5

SUPPORT TEAM

Dorothy Gilford	National Center for Educational Statistics
Harry Piccariello,	O.E. Office of Program, Planning, and Evaluation
Robert Kane,	O.E. Office of Management Information
Beth Drake Roy,	Bureau of Budget
Richard Carlson,	Bureau of Budget
Leon Schwartz,	O.E. Office of Administration

The School and Pupil Centered Evaluation Instruments Committee, chaired by Dr. Phillip Kearney of Michigan, is concerned with evaluation data reflecting on the outcomes resulting from the flow of dollars to schools in the form of services and activities to pupils. Thus, a set of instruments was needed to obtain information which would describe the activities and services provided in the schools, the context in which these various programs were offered, and the outcomes for various types of individuals who participated in the services and activities. This effort is an attempt to relate the various kinds of students participating in different programs to the outcomes which occur. Rather then building on the national surveys which had been undertaken in past years to evaluate four Federally funded programs, a new instrument is in the process of development which will provide a comprehensive evaluation of ten programs: Titles I, II, III, V, VII and VIII of ESEA; Titles III and V-A of NDEA; Vocational Amendments of 1968; and Title IV of the Civil Rights Act , including these four.

The third working committee is the Evaluation Training and Local Evaluation Committee, chaired by Mr. Charles Nix of Texas. The committee has the responsibility for exploring long range evaluation needs at the state and local levels. In dealing with this responsibility, the members of the group agreed that assistance in providing orientation and training in evaluation for local staff personnel was necessary. Therefore, part of their effort was the design of several one-week institutes intended to acquaint state and local personnel with evaluation tools and techniques. In addition, the committee sought to develop a Guide for use by individuals responsible for local evaluation and report preparation.

JCES Manpower Requirements

Table 6 shows the O.E. manpower requirements in manmonths for the various tasks required for development of the JCES instruments. The figures on the table are essentially a summary of the ten individual Gantt Charts prepared by U.S.O.E. and reflect full time Office of Education employee requirements only. They do not take into account any contractor personnel. The total requirement for the period from FY70 through FY73 is 2489.4 manmonths (357.5 for FY70; 678.7 for FY71; 682.2 for FY72; and 771.0 for FY73.) The JCES instruments included in the table are:

1. Consolidated Program Information Report
2. Pupil Centered Instrument (Elementary)
3. Project Descriptor Instrument
4. Common Status Measures
5. Program Reference File
6. Pupil Centered Instrument (Secondary)
7. State Management Report
8. Consolidated State Application
9. LEA Consolidated Application
10. Anchor Test

TABLE 6

MANPOWER REQUIREMENTS (MANMONTHS) FOR JCES

TASK DESCRIPTIONS	FY70												TOTAL FOR YEAR
	J	A	S	O	N	D	J	F	M	A	M	J	
A. Develop & Install Instrument													
1. Review & Evaluate present information	50	50	10				110	65	20			60	36.5
2. Draft Instrument Content		25	35	20				90	45	20			23.5
3. Review Content-OE			20	35	20	05			45	30	20		17.5
4. Review Content-SEA			05	30	20	05	10		15	20	40		14.5
5. Draft Instrument			18	35	15	20	15	05		35	25	10	17.8
6. Approval of Draft	20			05	15	15	20	05	05		65	45	19.5
7. Form Clearance/Field Test		05			30			30	15	15	20	40	15.5
8. Field Test		15	15		40	35	05		10	10	05	20	15.5
9. Revise Draft			05	03	15	25	05			05	10		6.8
9A. Local Target Pop. Census Procedure													
9B. Develop Attribution Manual		10	20	10	05	10	05	05	05				6.0
9C. Stratification models fqr Instrumentation Sample Designs													
10. Develop Analysis Plan													
10A. Prepare Table Shells	05			05	20	20	32					30	11.2
10B. Review-OE	05	05			05		30						4.5
10C. Revise Table Shells				03	05		20	15					4.3
11. Sample Selection	40	20	80	80	80	35	60	30					42.5
12. Final Forms Clearance		10	20	10		20	10	60	10				14.0
13. Determine External Flow	03	05				05	10	22	05	03			5.3
14. Final Instrument Revision & Approval				05	10	15	03	15	20				6.8
14A. LMR Instrumentation													
14B. SMR Instrumentation													
14C. Secondary Instrumentation													
15. Print Instrument				02			07	10	10	10			3.9
16. Mail Out Date				03			03	02	05	06			1.9
16A. Validation Studies						05	10	10		05	10	10	5.0
17. Date due in OE													
B. Develop Requirements Specifications			15	15				30	50	35	15	30	19.0
C. Automatic Data Processing													
1. DADP				10	20	20	10		20	30	60	60	23.0
2. Bureaus						25	25					40	9.0
D. Final Report						10	20	30	20	10	10		10.0
E. Redeveloping and Recurring Costs													
1. Instruments Redevelopment to Mail Out Bureaus									20	60	80	80	24.0
2. ADP - OMI - 0													
TOTAL	123	145	243	271	300	270	400	424	320	294	360	425	357.5

TABLE 6 CONT.
MANPOWER REQUIREMENTS (MANMONTHS) FOR JCES

TASK DESCRIPTIONS	FY71												TOTAL FOR YEAR
	J	A	S	O	N	D	J	F	M	A	M	J	
A. Develop & Install Instrument													
1. Review & Evaluate present information	6.0	6.0	6.0	1.0	1.0								20.0
2. Draft Instrument Content													
3. Review Content-OE				5.0	5.0	4.0	4.0						18.0
4. Review Content-SEA					5.0	5.0		4.0	4.0				18.0
5. Draft Instrument							30			4.0			7.0
6. Approval of Draft	20.							5.0	5.0		40		16.0
7. Form Clearance/Field Test	4.0	20								4.0		40	14.0
8. Field Test	4.5	4.5	20								5.0	2.5	18.5
9. Revise Draft	2.0	1.5	2.0								1.5	15	8.5
9A. Local Target Pop. Census Procedure													
9B. Review-OE				0.5	1.0	0.5							2.0
9C. Stratification models for Instrumentation Sample Designs													
10. Develop Analysis Plan													
10A. Prepare Table Shells	1.0	10	9.0									1.0	12.0
10B. Review-OE	0.5	1.0	0.5	25									4.5
10C. Revise Table Shells	1.0		1.0	3.0									5.0
11. Sample Selection	1.5		2.0	4.0	1.0								8.5
12. Final Forms Clearance	4.0	2.0	4.0	3.0	4.0								17.0
13. Determine External Flow	02	1.2	2.1	12	20	0.5							7.2
14. Final Instrument Revision & Approval		2.0	1.2	0.8	1.0	1.0							6.0
14A. LMR Instrumentation													
14B. SMR Instrumentation													
14C. Secondary Instrumentation													
15. Print Instrument			1.5	1.0	0.2	1.0	0.3						4.0
16. Mail out Date				0.5	0.2	0.5	0.3						1.5
16A. Validation Studies	1.0	1.0				1.0	1.0	0.5					4.5
17. Date due in OE													
B. Develop Requirements specifications			3.5	6.0	4.0	40	1.0				1.5	30	23.0
C. Automatic Data Processing													
1. DADP	8.0	6.0	60	6.0	7.0	8.0	7.0	8.0	8.0	8.0	80	8.0	88.0
2. Bureaus	6.0	80	8.0	8.5	5.0	5.0	9.0	80	8.0	2.0	8.0	80	83.5
D. Final Report		1.0	1.0		2.0	2.0	6.0	6.0	4.0	7.0	7.0	20	38.0
E. Redeveloping and Recurring Costs													
1. Instruments Redevelopment to Mail Out Bureaus	8.0	8.0	8.0	11.0	18.0	22.0	26.0	26.0	260	26.0	26.0	26.0	231.0
2. ADP - OMI - O				1.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	23.0
TOTAL	49.7	45.2	57.8	55.0	58.4	56.5	60.6	60.5	58.0	54.0	64.0	59.0	678.7

TABLE 6 CONT.

MANPOWER REQUIREMENTS (MANMONTHS) FOR JCES

	FY72												TOTAL
TASK DESCRIPTIONS	J	A	S	O	N	D	J	F	M	A	M	J	FOR YEAR
A. Develop & Install Instrument													
1. Review & Evaluate present information													
2. Draft Instrument Content													
3. Review Content-OE													
4. Review Content-SEA													
5. Draft Instrument													
6. Approval of Draft													
7. Form Clearance/Field Test													
8. Field Test	4.0	4.0											8.0
9. Revise Draft			4.0										4.0
9A. Local Target Pop. Census Procedure													
9B. Develop Attribution Manual													
9C. Stratification models for Instrumentation Sample Designs													
10. Develop Analysis Plan													
10A. Prepare Table Shells	1.5		1.0	1.0									3.5
10B. Review-OE	1.5				1.5								3.0
10C. Revise Table Shells		1.5			0.7								2.2
11. Sample Selection		2.0	2.0			3.0							7.0
12. Final Forms Clearance		1.0	3.0			1.0	3.0						8.0
13. Determine External Flow			1.5	0.5			0.7	0.2					2.9
14. Final Instrument Revision & Approval			1.0	1.5				0.5					3.0
14A. LMR Instrumentation													
14B. SMR Instrumentation													
14C. Secondary Instrumentation													
15. Print Instrument				0.5	0.2			0.5	0.2				1.4
16. Mail out Date					0.5				0.2				0.7
16A. Validation Studies					10	1.0	0.5		0.5	1.0	10	1.0	6.0
17. Date due in OE													
B. Develop Requirements Specifications				2.0	4.0			2.0	4.0		3.0	6.0	21.0
C. Automatic Data Processing													
1. DADP	7.0	6.0	6.0	60	6.0	8.0	8.0	8.0	80	10.0	10.0	8.0	91.0
2. Bureaus	4.0	14.0	14.0	10.0	25	5.0	9.0	8.0	10.0	6.0	8.0	4.0	94.5
D. Final Report				2.0	2.0	2.0	2.0	6.0	6.0	7.0	7.0	2.0	36.0
E. Redeveloping and Recurring Costs													
1. Instruments redevelopment to Mail Out Bureaus	26.0	26.0	26.0	260	28.0	30.0	30.0	30.0	32.0	34.0	34.0	34.0	356.0
2. ADP - OMI - 0	2.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	4.0	34.0
TOTAL	46.0	57.5	61.5	51.5	49.4	52.0	56.2	58.2	63.9	61.0	66.0	59.0	682.2

TABLE 6 CONT.

MANPOWER REQUIREMENTS (MANMONTHS) FOR JCES

TASK DESCRIPTIONS	FY73 J	A	S	O	N	D	J	F	M	A	M	J	TOTAL FOR YEAR	GRAND TOTAL
A. Develop & Install Instrument														
1. Review & Evaluate present information														55.5
2. Draft Instrument Content														23.5
3. Review Content-OE														35.5
4. Review Content-SEA														32.5
5. Draft Instrument														24.8
6. Approval of Draft														35.5
7. Form Clearance/Field Test														29.5
8. Field Test														42.0
9. Revise Draft														19.3
9A. Local Target Pop. Census Procedure														
9B. Develop Attribution Manual														8.0
9C. Stratification models for Instrumentation Sample Designs														
10. Develop Analysis Plan														
10A. Prepare Table Shells														6.7
10B. Review-OE														2.0
10C. Revise Table Shells														11.5
11. Sample Selection														8.0
12. Final Forms Clearance														39.0
13. Determine External Flow														15.4
14. Final Instrument Revision & Approval														15.8
14A. LMR Instrumentation														
14B. SMR Instrumentation														
14C. Secondary Instrumentation														
15. Print Instrument														9.3
16. Mail Out Date														4.1
16A. Validation Studies	1.0	0.5				1.0	1.0	0.5					4.0	19.5
17. Date due in OE														63.0
B. Develop Requirements Specifications														
C. Automatic Data Processing														
1. DADP	10.0	10.0	10.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	6.0	100.0	02.0
2. Bureaus	9.0	18.0	18.0	17.0	14.0	14.0	4.0	8.0	10.0	6.0	8.0	4.0	130.0	17.0
D. Final Report				4.0	4.0	4.0	22.0	22.0	4.0	9.0	9.0	2.0	80.0	164.0
E. Redeveloping and Recurring Costs														
1. Instruments redevelopment to Mail Out Bureaus	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	408.0	1 19.0
2. ADP - OMI - 0	3.0	3.0	3.0	2.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	49.0	06.0
TOTAL	57.0	65.5	65.0	65.0	64.0	65.0	74.0	72.5	61.0	62.0	64.0	51.0	771.0	2, 89.4

The following is a description of the tasks as listed in the left hand column of the table:

Instrument Task Descriptions

A. Develop and install instrument

1. Review and evaluate present information - This task encompasses the collection and review of forms, informational interviews with management, review of plans, etc.
2. Draft consolidated instrument(s) content - Based on the information acquired in the previous task, construct a list of proposed data elements.
3. Review proposed instrument content with OE management - This task will require review with OE, Bureau, division and program level management.
4. Review proposed instrument content with SEA representatives - the proposed instrument content will be reviewed initially by the States represented in the joint SEA/OE Task Force on Evaluation. Comments will be solicited on the reportability of the data requested and relevance to SEA needs. Regional meetings will be conducted after the initial Task Force review to involve the remaining states.
5. Draft instrument format - The information acquired in the three previous tasks will be codified and evaluated and a draft instru-

ment will be prepared.

6. Obtain approval of draft instrument - This task will repeat the review channels utilized in steps 3 and 4 above in order to obtain preliminary approval. Any necessary revisions will be made during this task.
7. Forms clearance for field test - Obtain BOB clearance for field test of draft instrument.
8. Field test - The instrument will be reviewed with intended respondents to determine feasibility of implementation and use.
9. Revise draft - Based on experience gained in field test, revise instrument content and/or format and prepare instrument in ADP format.
10. Develop analysis plan - Draft table shells
    a. Draft table shells - This task will relate the input data elements to the previously determined management information needs in the form of output table shells.
    b. Review with OE management - The proposed tables will be reviewed and cleared with all levels of management in OE.
    c. Revise table shells - Table shells will be revised, if necessary, to reflect management comments received in above task.

11. Sample Selection - Specifications for the sample will be forwarded to NCES or a contractor and a sample will be drawn based on the purposes the instrument is designed to serve.

12. Obtain final forms clearnace - This task includes the preparation of a package containing the instrument, narratives describing data utilization, and the sample plan and clearance through OE forms clearnace channels and the Bureau of the Budget.

13. Determine external flow - The procedure flow and responsible channels for mailing and return to OE of the instrument(s) will be determined.

14. Final instrument revision and approval - Revise instrument, as required, by form clearance authorities. Prepare requisition for printing and mailing and obtain administrative clearance.

15. Print instrument - This task encompasses the time line for monitoring and actual printing of the instrument through the Government Printing Office.

16. Mail out - Accomplishment of this milestone will in all cases be keyed to the success of the total implementation to the DHEW Printing Office.

17. Due date to OE - This milestone indicates the date specified on the instrument for return to OE or a designated contractor. Normally this is also the date follow-up of late respondents will begin.

B. Develop requirements specification - This specification will include as a minimum; the input instrument format and data definitions; the output formats and data relation to the input, the internal flow and control procedure, the specific time requirements, and the interface requirements with previously developed instruments sub-systems.

C. Automatic Data Processing (ADP)

1. Automatic Data Processing Division

   A. Develop ADP system specifications

      a) system flow chart(including, interface with other sub-systems).

      b) system computer configuration

      c) manpower, time, and cost analysts

   B. Prepare package for contracting, if required.

   C. Develop sub-system(s)

      a) detail design

      b) programming

      c) testing

   D. Develop system

      a) integrate sub-system(s)

      b) system testing

   E. Review system results with management.

3

F. Revise system as required.

G. Complete system documentation for production control.

H. Implement system

a) capture data (keypuch, etc.)

b) training

c) production

2. Bureaus

A. Editing and error correction

B. Follow-up on respondents

C. Review of sample system outputs with ADP

D. Training in use of system's inputs/outputs

D. Prepare Congressional Reports and Program Publications-Most instruments have as their primary end product a report to Congress. This task involves the selection and preparation of significant tables for inclusion and a narrative interpretation of the data. The steps in preparation involve program officers, information specialists and Division, Bureau and OE management levels.

E. Instrument Redevelopment and Recurring Costs

1. The instrument must be reviewed each year to take into account changing legislative and program information requirements and experience gained in implementation. The steps involved in initial instrument development must be retraced on an annual

basis to accomplish the redevelopment task. For example, program officers, Bureau management and OE management must be reinterviewed to insure instruments are meeting their needs.

2. A constant data processing effort of system maintenance and redevelopment will be required in order to maintain systems that are responsive to ever changing and increasing requirements. Special output requirement, usually "one-time" in frequency, are also included in this task,

Contractual Requirements

In addition to the O.E. staff members that will be required, outside organizations under contract will be used to assist in the development and implementation of the system's data collection instruments.

For the Consolidated Program Information Report (CPIR), contractors will be used during FY70 to revise the draft instrument, develop the attribution manual, assist in the development of the data analysis plan, print and disseminate the instrument, conduct validation studies, assist in the data processing and prepare the final report. During FY71, contractors will continue with the development of the attribution manual for the CPIR, print and disseminate the instrument, conduct validation studies, assist with the data processing, and prepare the final report. During FY 72 and FY73, contractors will be required to conduct validation studies on the data collected by the CPIR, assist with data processing and preparation of the final report, and help with any instrument redevelopment.

For the Pupil Centered Instrument (Elementary), contractors will be used in FY 70 to prepare the instrument content, assist with the data analysis, print and disseminate the instrument, conduct validation studies,, assist in the data processing, and prepare the final report. During FY71, 72, and 73, contractors will assist with the data processing, prepare the final reports, and help with any instrument redevelopment.

For the Project Descriptor Instrument, contractors will be required in FY70 to prepare the instrument content and assist with any required content revisions. During FY71, contractors will be needed to print and disseminate the instrument and assist with the data processing. During both FY72 and FY73, contractors will be used for any instrument redevelopment tasks and for data processing.

For the Common Status Measures, contractors will be used during FY70 to draft the instrument content, print and disseminate the instrument, and assist with the data processing. During FY71, 72, and 73, contractors willl be required for assistance with the data processing and for any instrument redevelopment(assuming the CSM are retained as a part of the SCES).

During FY70, contractors will be used to assist with the sample design for the Program Reference File. During FY71, contractors will be needed to print and disseminate this instrument, assist with the data processing and prepare the final report. Contractors will be used during FY72 and 73 to assist with the data processing, prepare the final report, and help with any instrument redevelopment.

For the Pupil Centered Instruments (Secondary) contractors will be required during FY71 to review and evaluate plans and information for the development of the instrument. During FY72, contractors will assist with the data analysis plans, print and disseminate the instrument, conduct validation studies, assist with the data processing, and help with any instrument redevelopment. During FY73, contractors will be required for the preparation of the final report, and for assistance with any instrument redevelopment and data processing.

For the State Management Report, contractors will be used during FY70 to review and evaluate plans and information for the development of the instrument. During FY72, contractors will be used to print and disseminate the instrument and to help with any instrument redevelopment. During FY73, contractors will be needed for the preparation of the final report, for assistance with data processing, and for help with instrument redevelopment.

For the Consolidated State Application, contractors will be required during FY70 to review and evaluate plans and information for the development of the instrument. During FY71, contractors will help with the final instrument revision, print and disseminate the instrument, and assist with the data processing and any instrument redevelopment. During FY72 and 73, contractors will be needed to assist with data processing and instrument redevelopment.

For the LEA Consolidated Application, contractors will be required during FY71 to identify the local target populations, assist with the final instrument revision, print and disseminate the instrument, and assist with the data processing. During FY72 and 73, contractors will assist with data processing and any instrument redevelopment.

Finally, contractors will be needed to conduct test studies during FY70, 71 and 72, to develop score equating for reading tests, math tests, and other subjects.

Political and Other Considerations in Implementation

This section stems from discussions with USOE Task Force members and from analytic review of the evaluation system problems taken in relation to previous experience. Some of these problems concern some of the political and practical considerations which must enter into development of an enterprise of this nature and scope. The section attempts to summarize the important considerations in this area but does not essay solutions to these problems.

Some Political Considerations

Many considerations are involved in the planning and development of an evaluation system and not the least of these is the relationships which exist between the evaluators (USOE) and those who may tend to feel they are being evaluated (The States and LEAS). Such relationships are extremely important to the success of this system, since all input data comes from these sources and their cooperative contributions are essential to success of the system. Under current circumstances, the USOE must negotiate separately with each of the fifty States in order to gain cooperation at that level, and further there must be a separate transaction with each school system or district which is to be contacted; still further, in some cases it is necessary to negotiate the cooperation directly with the schools within a district. Other problems may arise at times in the attempted application of a survey instrument, e.g., the sometimes difficult negotiations with teachers' unions and similar special groups.

At the same time, the current relationships of USOE, and the Federal Government in general, with the States and local agencies periodically become somewhat strained due to the heavy workloads imposed by the present reporting requirements, referred to earlier. States, districts, schools and teachers all tend to resent the imposition of any additional workload and in many cases this resentment builds to concrete resistence to performance of the requested tasks. Therefore, insofar as possible, the developing JCES should be based on the principle of non-increased workloads on teachers, schools, districts or State agencies, and it should be designed to reduce these loads wherever possible, without sacrifice of data quality and sufficiency.

Some Practical Limitation on USOE

A major factor affecting the conduct and reporting of any evaluative effort is the basic requirement for an annual report to Congress of these efforts - due 31 January of each year. This requirement, with the due date in the middle of the school year, works to force the USOE to conduct either "old evaluations" (data from last year being evaluated) or "quick and dirty" evaluations of the current year's data. Evaluations based on surveys which must be mailed to school, or districts, and then must be returned, analyzed, interpreted and reported, are simply not easily done and, when the whole process is limited to a few months of time, they are unlikely to be either comprehensive or reliable. Thus any survey initiated in the Fall is threatened with inadequacy because of the stringent time period for completion. The only possible answers to this problem seems to be either to remove the limitation of time for data collection and reporting - through later reporting dates or perhaps biennial evaluations - or to develop so comprehensive and coordinated an evaluation process that the whole job of data collection, analysis, and interpretation runs quickly and smoothly from start to finish, with no hitches (and probably with no possibility for asking or answering any unique questions in any application of the survey). Such a completely routinized evaluation system would undoubtedly handle most of the evaluation requirements of the USOE and related agencies, but it might well result in a rather stagnent evaluation process, as well, which might partially negate the advantages of the process.

Even though there are some serious drawbacks to a routine evaluation system such as envisioned above, this concept of a coordinated, complexly interrelated, relatively routinized system should probably form the heart of the new JCES. This should be augmented with an innovative, interrelated inquiry system allowing derivation of answers to non-routine questions and should also provide a methodology and techniques for updating and modification of the instruments used for data collection from year to year.

Such a system will not eliminate certain other internal problem areas related to system development and application, and these may still force a real, if not legalized, requirement to fall back to a two year system of reporting despite the routinized data collection and evaluation capability. These internal items are certain regulations and practices related to the areas of instrument development or modification, survey conduct and local agency cooperation, and report preparation and clearance for external release. For example, in the development or modification of a new survey instrument alone, there are multiple internal hurdles to clear:

1) First, the development of a major instrument requires a contractual arrangement for development and standardization. This requires an RFP and contractor selection process, which can rarely be accomplished in less than 60 days. Contributing to, and probably adding to, this time are the three internal levels which must be cleared before funds can be

released: a) USOE/Bureau level; b) Plans and Programming Secretariat (USOE) and c) Bureau of the Budget. These clearances may be quickly or slowly obtained and variations are unpredictable. Delay at any level lengthens the period prior to contract agreement. After the contractor is aboard, the delays necessary for actual development or modification of the instrument ensues.

2) As part of the development and application of any instrument, it is necessary to have the National Center for Educational Statistics (NCES) review or develop the research/sampling design for the use of the instrument. This requires internal coordination and frequently adds to the delay in application.

3) Following completion of the instrument and approval or construction of the sampling designs by NCES, the instruments themselves must be cleared for application in the field. Again there are multiple levels of clearance: USOE clearances include, again, NCES and the PPE Secretariat, and the forms must be cleared by the Bureau of the Budget as well, unless used strictly for research purposes and not to be routinely applied. These clearances add again to the period of time necessary to develop and implement any survey instrument.

Report preparation and submission is subject to a similar series of examinations and reexaminations which include clearance by: a) NCES for statistical appropriateness; b) USOE/PPE for substantive treatment and clarity of reporting; and, c) the Press Office must clear the report for general acceptability and concordance with other related data reported or existent. These delays add to an approximately six to nine month lag between the receipt of a contracted or internally prepared report and its delivery to Congress or other external users.

Evaluation Criterion Problems

The JCES implementation will encounter all of the usual problems associated with the development and implementation of any evaluation process or system. These certainly include the basic measurement problems related to the instruments and their analysis, such as reliability and validity; but these are complicated here by the multiple criterion nature of the process and products which are to be evaluated. This relates to the basic difficulty of adequate measurement for each of the program processes under examination, but also extends to the problem of attribution of effects to probable causes, since the Congress and the Public want to know what they have accomplished for their money spent. Cause-effect identification is always difficult but will be especially so in the situation described in the Delivery System. With the Funding Subsystem and the Substantive Program Subsystem overlapping to the degree indicated, one will seldom be sure which of the various funding programs have contributed most (or any) to a particular Substantive Program and the resultant changes occur in pupil behavior.

Thus, substantive programs may be evaluated by assessing changes in the pupils, or the communities, if so directed. But these changes, or lack of changes, might not necessarily reflect the values of the Funding Programs, since usually a true substantive program results from funding under several of the various Titles. Another aspect of this difficulty is that the Funding Subsystem may define the general area of even the intended content of a Substantive Program for application, but the actual presentation of the Program may be considerably different from what was intended and approved. Obviously, such changes may be good or they may be bad, but the fact of change negates the use of the products of such a Substantive Program as valid measures of the Funding Subsystem's effectiveness. Such Programmatic changes may be directly indicative of the quality of local management or directiveness, and might be used to assess needs for modification of management procedures or in-service training projects; but they are not sufficient measures of the total management structure's success of failure nor should they be used as sufficient indicators of a Funding Program's total worth.

Implementation of Surveys

Another factor affecting the development and implementation of this system is the set of variables related to the management and administration of the surveys. Since all surveys are mailed to schools or districts, the adequacy and completeness of the data derived are dependent upon the conscientiousness and competence of the persons completing the survey instruments. The evaluation of the total delivery system, including both the Funding and Substantive Program Subsystems, is entirely dependent upon the willingness and skills of persons about whom these qualities are usually almost unknown. Because of these local survey administration problems, USOE takes the position that the best approach, where possible, is to establish the responsibility of one person for local completion of the instruments and their return to the USOE. This precaution is likely to result in both a higher rate of return of data instruments and a higher degree of reliability and validity of the data entries.

A related point concerns the kind and degree of data "editing" or local quality control - of both the data reported and of the pupils and projects on which they are reporting - which may be exercised in the process of instrument completion. While instructions always attempt to standardize such processes (and to eliminate the selection of especially favorable data, for example) this facet of data collection is essentially beyond the control of the USOE. The best which can be done is to develop complete and concise instructions for such collection and to attempt to estimate the degree of veracity through related reliability and validity studies on subsamples of the original groups assessed. An adjunctive approach is possible through the development and implementation of standardized administration/evaluation guides (like the Local Evaluation Handbook, developed by AIR and intended for use in conjunction with the JCES) or of local in-service training programs on evaluation, survey collection requirements, and related topics.

Effects of Biases

The above considerations are complicated still further in the evaluation attempt by the various local or individual biases to be found with respect to educational objectives, Federal intervention, evaluation purposes and many other topics, of which the biases for or against tests and testing is not the least difficult to deal with. Although all such biases will affect the degree of cooperation and the adequacy of the data obtained from State and local agencies and in the schools, themselves, testing biases, and fears related to testing results, pose a uniformly difficult problem. State and local personnel frequently react negatively to the concept of (perhaps unfavorable) comparisons which they feel may be inherent in any evaluation system. Such reactions have led States and districts to deny the implementation of instruments in their systems before and may do so in the present instance.

All of the above considerations must influence the development and implementation planning for the installation of the Federal/State Joint Comprehensive Evaluation System.

Research/Sampling Designs:

Current Developments

The current implementation schedule, presented earlier in this section, indicates that the CPIR has already been applied to a sample of school districts. Similarly, the 1968 Survey of Compensatory Education and the 1969 Survey were applied to samples of schools in the Spring of the respective years. These Surveys are the forerunners of the JCES Elementary level Pupil Centered Instruments (PCI) in the Spring of 1970, again to a sample of schools and a sample of children within schools.

For each of these instrument applications, the National Center for Educational Statistics has developed a sampling plan consistent with the research/evaluation aims of the instruments and has drawn the actual samples. For example, the 1968 Survey was administered at four levels - District, School Principal, Teachers (2nd, 4th, and 6th grades), and Pupils (completed by the Teachers) - within 465 districts across the country. These 465 Districts were determined by a sample plan developed by NCES and were drawn from four strata of districts (divided on enrollment population). Following selection of Districts via stratified random sampling (with the largest size stratum being sampled exhaustively), schools were sampled within Districts in the ratio of 1:1.4. Within the sampled schools, all Principals were surveyed, as were all Teachers of the three grades concerned. Each Teacher reported on pupils at the approximate rate of 1/5 of their class memberships. This, in brief, is the sampling process which was applied. And the same sample was used for the 1969 Survey of Compensatory Education, also.

Analyses of the 1968 Survey data revealed that the sample yielded excessively large Coefficients of Variation on several important measured characteristics, and that these were especially large within the top most strata (which had included Districts with student population of 40,000 and above.) These findings led to the design of a larger sample of Districts and schools for the application of the FY 1969 CPIR (applied in Fall, 1969) and this sample will also be used for the collection of the PCI data in April 1970. This sample and its development process will be discussed below, since this is the most current and thus most representative, of the sampling/research designs developed by BESE/NCES for JCES use.

The 1969 sample derivation followed generally along the lines of the 1968 sample. It utilized a stratified random approach to sampling first 830 Districts, (from a list of those District of over 300 student enrollment and receiving State Plan funds from Federal Titles); and, second, schools within these Districts, drawn randomly from a list of district schools ordered on their "average within-grade size," for 2nd, 4th, and 6th grades. Strata boundaries used in the 1969 sample differed from those of the 1968 sample, as did also the number of pupils reported on by Teachers. Certain other variations were observed in the sample development, but these were the most important ones. The survey sample was augmented for the FY 1969 CPIR administration by adding all LEA's receiving direct grant funds, yielding a total CPIR sample of approximately 1500 Districts. This augmentation is not anticipated for the 1970 PCI application, and only the 830 selected Districts will be surveyed.

The following table describes the characteristics of the derived sample of Districts:

Stratum Boundaries (Student Enrollment)			Number of districts in Population	Sampling Fraction	Number of districts in Sample
125,000	-		13	1/1	13
35,000	-	125,000	95	1/1.3	72
9,000	-	35,000	699	1/6	117
3,000	-	9,000	2272	1/9	252
300	-	3,000	8671	1/23	376
		Total=	11750		830

As may be seen the strata used were five in number, instead of the four sampled in the 1968 Survey sample development. This was done in an attempt to reduce the extremely large within stratum variance found in the upper stratum (40,000 and up) of the 1968 sample. Breaking this stratum, consisting of 92 Districts in 1968, approximately two strata of 35,000 to 125,000, (with 95 Districts), and 125,000-plus with 13

Districts, should have reduced the variance in the topmost stratum to a level which would be more commensurate with the other within-stratum variances. In fact the boundaries of these strata were determined primarily through the process of iterative comparisons of within strata variances with different stratum boundaries until the variances became as nearly equal as feasible. It should be noted that the variances being manipulated for this purpose were the variances of student enrollments for districts in the strata examined. That is, when a given boundary set was used, the resulting population was examined across strata on the size of the variances within-strata in student enrollment per districts within the stratum. The process was actually performed using the Coefficient of Variation for each "experimental" stratum, but the desired effect is the same as were one to use variances.

Following the derivation of the above listed stratum boundaries, the number of districts to be samples in each stratum was determined using the Strata variances in the normal computation to determine sample size required.* Each derived sample size was then multiplied by 111% to allow for non-response. This resulted in the individual strata sample numbers shown in the above table, with the highest stratum being sampled exhaustively again, as is a common result in such allocation techniques.

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* This computation used the standard ± 2 signma interval to produce an n large enough to yield Coefficients of Variation of 5% at the .95 confidence level.

This derived sample (+ those LEAs receiving direct Federal Grant Funds) was sufficient for the CPIR administration, since that instrument is completed at the District level only. However, for the purposes of the 1970 PCI survey, this sample of Districts must be subsampled for schools to surveyed. The process to be applied here involves first the determination of how many schools need be sampled in each district and then the selection of these randomly from a list of district schools ordered on "average-within-grade-size" for the three grades of interest. The first point, how many schools within districts, is to be determined as follows:

1. The number of classes per grade for the three grades per school will be determined, within each District sampled.

2. Since the number of pupils to be reported on will be four per class per grade, per school, (all classes of those grades within a sampled school will be surveyed) the total number of schools necessary depends on the total number of pupils desired in the total sample. (This number has not yet been set, when it is, the following steps can be performed.)

3. Given the total number of pupils within grade levels desired in the school sample, this number should be allocated among Districts in proportion to the number of classes (teachers) within the District for each of the three grades of interest.

4. Since one quarter of the allocated number of pupils desired from each District will equal the number of classes required for the District sample, this number divided by the total number of classes in the District (within grade level in each case), will yield a ratio which can be used as the sampling ratio for schools within that District and which will yield very nearly the desired number of pupils in the District and in the total sample of 830 districts.

The PCI survey in April of 1970 will send the various level forms to the sampled Districts, schools and teachers derived according to the processes described above.

Further Sampling Developments Required

Although the current instrument applications are intended to provide only a Nationally representative set of data, furture demands of the JCES and the Belmont States needs will make State representative samples much more desirable. This is planned for development for the FY 1970 application of the CPIR (Fall 1970 collection.) The sample development for that application will include approximately 4000 LEA's and will be comprised of State samples for the Belmont States at least. This development of State-representative samples is likely to continue and to be required for most of the National survey applications of the various instruments. Thus is is predictable that the PCI survey in 1971 will be performed on a State and Nationally representative sample.

The development of additional sampling plans to meet these needs is a current requirement for development to assist the JCES in meeting the commitments to the Belmont States. Therefore, the development of such State representative samples of districts and schools must be accomplished within the next six months to provide for the proposed application of the CPIR to such State samples. The precise approaches to these developments have not been defined, but it may be assumed that they will be highly similar to those applied to the recent survey implementations.

Future Sample/Research Design Requirements

The following discussion and comments represent additional consideration of the problems associated with design of State and National samples for the implementation of the various JCES instruments. They relate directly to an extension of the current designs described above.

Comments Concerning Future Sampling Plans

Future sample plan developments for the JCES implementation require some additional consideration of the problems of meaningful stratification factors be sampled to the various strata or cells of the derived designs. Some pertinent comments are presented below.

1. Stratification Foactors Revisited.

In the sampling plans described above, the only stratification factor used was the student enrollment of the Districts; student enrollment was also to be used to order schools within Districts.

This is not a sub-stratification, but rather an ordering process to assure that the sequential draw would yield a dispersion of sample schools on enrollment size within District. However, it appears that stratification on enrollment, was done because it was the major factor on which population data were available for computation of the population variances (for use in adjusting stratum boundaries, as described previously.) When the survey data become available from the 1968 and 1969 Surveys of Compensatory Education, the CPIR administration, and the 1970 application of the PCI's, these data could be used to examine the effects that shifting the boundaries of enrollment-size-stratification might have on the Coefficients of Variation for estimates of these variables of major interest: e.g., - academic achievement scores or, from the CPIR, total Federal funding by Title and Target group. This study could be played off in the same manner in which the boundaries of enrollment size strata were determined previously. There the shifts in boundaries were to produce near-equivalent Coefficient of Variation on enrollment estimates across all strata. This study would be directed at shifting school data on the variables of interest back and forth, from one stratum to another, in the same manner as above and examining the changes in the CV's of the major variables of interest as a function of stratum boundary shifts. This study would provide data to support or deny the effectiveness of stratification on enrollment size alone for obtaining the desired presision of estimation with respect to other variables.

Obviously, the study suggested would require time and effort on the part of NCES, BESE, or OMI, and this expense should not be squandered. To avoid the necessity for such a study for all variables of interest, a preliminary investigation of the relationships between the variables of interest and district enrollment size should be performed. Correlation of district mean values for each variable with district size would provide an indication of the degree to which these variables are related. This relationship would then indicate the suitability of using enrollment as a stratifier. If correlations of $r = .60$ or upwards were consistently obtained for all variables, then stratification on these other variables instead of enrollment size would be unlikely to improve the precision of estimation very greatly. But, if some or many correlations between enrollment size and other variable means were to be on the order of $r = .20$ to .50, one might suspect that stratification on enrollment size was failing to contribute significantly to precision in the estimates for these variables. In that case, the study suggested above should be done to determine the degree of effect of sample size boundary shifts on the precision of estimation of the variables of interest. This could conceivably result in coming up with better bases for stratification (even if still on enrollment size, but with the boundaries determined on the basis of the known effects of size variations on other variables.)

Another question for consideration is the effect of performing the same study using school size and school mean values for the other variables. The results of this study might differ significantly and importantly from those based on district data. If this were to be so, then the use of District based samples for deriving variable estimates for schools migh be seriously questioned.

2. Allocation Methods

This comment concerns the method used to predict and allocate the sample size across a strata. For the most part, surveys are aimed at the estimation of parameters of only a few variables, usually one or two. The majority of the JCES instruments are collecting data and estimating parameters on a dozen or more variables. Experience has indicated that when this is the case, the optimum allocation model should probably be used to predict total sample size required and allocate this number across the cells of the strata. Hanson, Hurwitz and Madow indicate that the additional power gained through application of this allocation model far outweighs the extra effort necessary to deal with the different weighting factors involved.*

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* Hanson, Hurwitz, and Madow, Sample Survey Methods and Theory, Vol. 1, New York: Wiley and Sons, _____________, p. 227.

3. Double Stratification

The use of two or more stratification variables can greatly increase the efficiency of the design with respect to the precision of estimation on these meaningful variables that are partially correlated with each of the two variables used as stratifiers. Under a double stratification paradigm, the use of enrollment size as an initial stratifier might become more utilitarian if the second stratifier were something like socio-economic status, or some other factor presumed highly correlated with the variables of major interest. Such a doubly stratified design can use the optimal allocation model to determine total sample size necessary and the allocation of this sample over the levels of the main stratification factor, and then this assuredly sufficient size for each stratum could be distributed over the levels of the second stratification factor on the basis of an equal probability model. Other more complex techniques are also available for optimum allocation to all cells of such a matrix and could be applied.

4. Overlapping Samples

An important point to remember in the development of samples for the implementation of the individual JCES instruments is the need to be able to interrelate estimates and data derived from the various instruments whenever this is possible. This implies that, wherever possible, the samples used for different instruments in a given year should either be identical or highly overlapping. This will result in development of data from various instruments on the same groups of schools, districts and pupils. Such a procedure could have three advantages: a) This could allow the direct relation of data from one survey to that from another if data are actually derived on the same group, permitting better interpretability of the data sets; b) Use of the overlapping samples for two different instruments (or for reliability or validity studies on one instrument) could allow the extrapolation of data from the subsample to the larger sample through use of the hyper-geometric sampling distribution for extrapolation of values and ranges; this might prove valuable for certain evaluative comparisons among instruments or data from the various instruments; and, c) The costs associated with drawing of multiple samples would be reduced and this could perhaps allow design of more representative and more efficient samples in the first place.

Use of the same sample, or of overlapping samples, for the application of multiple instruments would be reasonably sound from the point of view of representativeness of the population, at least, as long as the reuse of the sample were in the same year as it was originally developed. During a single year the populations of most districts, schools and pupils would not change by an amount important enough to demand a new random sample draw; and if one's sample were random the first time used, it would be random the second time, also. Furthermore, even if the populations did change within a year, updated information with which to draw additional samples would usually not be available within the year in a form suitable to be used in a new draw.

General Guideline for Sample Development

The 1970 sampling requirements call for the generation of Elementary school samples, separately, which are representative on a State by State basis (or within a State). These samples are to be used for the administration of the PCI's within the Belmont States. Aggregation of these to a National level sample will involve additional sampling of Non-Belmont States. Some general guidelines for the research/sampling design development are presented below:

1) The desired evaluations are to be Local and National so the development of interrelated samples and designs is necessary . These should include:

   (a) For each of the cooperating States separately, a design to allow direct comparative evaluation of school and pupil characteristics through the various data instruments of the Evaluation Package. This cells for a discrete sample, for each State, representative of the State to a degree sufficient for generalization at the level of individual pupils and schools within the State.

   (b) A design for the same evaluation capability on the same characteristics for the aggregate of the Belmont States. It is presumed that the sample for this aggregate is simply the combination of samples for the individual States. However, there may be good reasons for constructing State sub-samples to represent this aggregation.

(c) A sample which allows comparative evaluation of characteristics of pupils and schools for the Nation, to at least the same degree of precision obtained for the other samples. It is assumed appropriate to incorporate smaller portions of the other (Non-Belmont) States such that these can be appropriately weighted in relation to the Belmont States to collectively represent the National population.

2) These samples, should be linked through School Districts to limit the administrative loads of USOE, States and Districts.

3) The research designs must concentrate on the Programs and their individual components as major factors for the stratification or identification of different groups of pupils and/or schools in order to assess the differential effectiveness of various Federal Programs and funded activities in the schools and Districts. These samples will be used to answer research questions of interest to BESE. The basic research questions

to be answered are indicated by the evaluation system objectives: the system is to assess and compare the pupils and schools within and among States and between and among Program activity classes. This requires the data collection on a sample of the defined population of pupils and schools corresponding to the types in question and operating under the conditions of interest. Whether all such questions could be answered through application of a single design, is unanswerable at present. It is certain that, given the universe of schools and the administration of the system instruments (to interrelated or discrete samples), the sample can be defined to meet specified research question requirements and can allow collection of adequate date to answer the questions.

Sample definition to collect data to answer such questions requires precise formulation of the questions to be answered, specification of the data types required to answer them and definition of the level of precision of description desired. These items are required because they determine what the basic unit sampled will be and how many units will be sampled.

The level of precision of description desired determines the units to be sampled. For example, a recent study developing a sample of elementary school students in fourth, fifth and sixth grades for the re-standardization of the reading subtests of commonly used Achievement Test Batteries used the school as the sampling unit. This was done in this instance because the unit of generalization of the data was to be children. Conversely in the 1968 and 1969 Title I Surveys of Compensatory Education and for the 1970 CPIR and PCI applications interest was centered at the District level, since it is mostly at the Districts that the various differences in funding occur. The basis unit is the district for those designs.

When the sampling unit has been determined, the next question involves the number of units to be sampled and the manner in which they are to be sampled. Stratified random sampling should be utilized, and the size of the sample drawn should be determined by variables measured and the level of precision required. Allocation of total sample size to strata should be by the optimum allocation method.

If Project Reference File is developed it will be an ideal sampling frame, since it will allow location of those schools, districts or States with programs of interest to them. In addition it will contain information which allows for meaningful stratification of the population.

The Project Reference File is to contain the following data types for each school entry:

1) State and County of location
2) School mailing address
3) School operating status
4) School District name
5) School District superintendent's name
6) Name of person responsible for Federally funded programs
7) Area code and telephone number of #5, above
8) Name of school building
9) Grade span of school
10) School membership by grade
11) Number of high school graduates for previous year
12) Degree of urbanism of school attendance area (four categories have been suggested for use: rural, small city, suburban, large city).
13) Lists of federally supported categorical aid programs in whcih the school participates. (Either for the total school or by grade).
14) And such other information which the State may

desire to enter for schools.

Among these data types, the following variables would be meaningful in stratification of the population for sampling:

1) State and County of School Location
2) District Name (and Size)
3) Grade Span of School
4) Enrollment (Total or by Grade)
5) Size of Graduating Class Last Year
6) Urbanism of School
7) Program participation (by Program and Title.)

Referring to the 1970 National and State sample needs, and ignoring temporarily the National Sample requirement, sampling will occur within a State. The following factors are of major concern in such sampling for the indicated reasons:

1) District Size (and location): Districts are frequently equivalent to counties and are always geographically distributed. District size variations are very large in some States and these variations are indicated to be related to variations in academic achievement and other variables of interest. If stratification by size is used appropriately, this

will group the more similar clusters (districts) into the same stratum and this will reduce the between cluster variance for the stratum, and thus increase the accuracy of estimation of parameters.

2) School Enrollment: If Schools within Districts can be stratified by enrollment/grade, this will further contribute to reduction of the within stratum variance for those variables correlated with school size.

3) Urbanism: While highly correlated with Districts (due to locations), this variable is also somewhat correlated with socio-economic status, intelligence and academic excellence. This factor should at least be considered for use in stratifying the population.

4) Program Participation: This variable is one of major concern to the total USOE paradigm. Stratification on this factor will work more effectively than any other to reduce the within-stratum variance of measures which are attributable in whole or in part, to differences in program participation. In other words, when variables are affected by Programs, stratifying on programs will yield the least error of estimation for those measures.

If any one of these factors were to be discarded in favor of a smaller matrix of cells it should be the Urbanism factor since this is partially overlapping (due to locations) with District size, School enrollment would be next factor suggested for elimination from stratification use, since it also overlaps in potential variance reduction with District size. Thus, a highly reduced set of two stratification variables might consist of:

1) Program Projects, and
2) District Size

State and National Research Designs

Given the requirements for State and National Sample/Research Desings as outlined by JCES implementation needs, it is possible to specify the approaches which can be taken to define and determine the eventual designs which should and can be developed. It is not possible to provide final sampling plans for these samples since no Universe File or Program Reference File, data are yet available.

The following set of guidelines for State and National sampling for USOE's current problem have been derived from the consideration above and the basic needs to provide estmates at the level of pupils within schools.

1) Sampling should be by a three stage cluster sampling method to lower basic costs of the sample and data collection and to provide adequate representation of each State and all of the cooperating States within the Nation.

2) The first stage clustering should be from a stratified frame based on the School Districts, stratified by size and by Program participation. (District sampling is indicated by the results of the 1968 Title I Survey.)

3) The second stage clustering should be of schools within the stratified District. Schools should also be stratified by program participation level, if possible, to provide data from schools with and without Programs.

4) Third stage sampling should be of students within grades within schools selected from the primary units, the Districts. The selected grades should be such as to yield data comparable to that derived from the earlier Title I Surveys. Elementary Grades suggested are the 3rd, 4th, and 6th, (overlapping the Title I surveys' 2nd, 4th, and 6th, but avoiding the observed lack of data availability for the 2nd grades).

5) Pupil sampling should be by sampling within each class section of the desired grades (this avoids the introduction of the fourth-level sampling of classes and then students.)

These guidelines summarize the approach which could be taken in this derivation of each of the Belmont State samples and also, with different levels of sampling in the non-Belmont States, for the National sample. This general approach is for a three-level sub-sampling of students, within schools, within Districts. It is also intended to obtain a self-weighting, epsem, sample of pupils (epsem - equal probability of selection method.)

REQUIREMENTS FOR FURTHER DEVELOPMENT FOR JCES IMPLEMENTATION

This section presents a brief summary of the major developmental efforts remaining for the proposed implementation of the total JCES in relation to the Federal/State/Local Delivery System. There is no attempt herein to develop the specific approaches to the further developments. Some of these have been suggested in the previous sections of this report and others have not yet been attacked. The following paragraphs consist primarily of a listing of the obvious and severe needs for this development and brief discussions of the needs.

Report Content and Format Specifications

This requirement is a most critical one for the further development of the total JCES. As discussed under System Reporting Requirements, previously, this requirement is critical to several other areas; to wit:

1. Detailed reports specifications are necessary in order to be sure that the various JCES instruments encompass and collect all of the data elements required to present the desired information to the managers and evaluators who are users of the outputs of the system.

2. Detailed report specifications are needed for the final development of the Master Data Analysis Plan (see below, also). As indicated under Master/Data Analysis Plan Development, previously, these specifications should be the basis for the detailed analysis plan development since they comprise the basic informational output requirements that the system is expected to provide. Although MDAP development could proceed without detailed report specifications, (for example, as based on best "guestimates" of any and all analytic processes which might be likely

to be required), the detailed report specifications development would greatly simplify and speed the MDAP and eventual data processing system developments.

3. Report specifications appear to be especially critical to the definition and development of the State Educational Agency Management Evaluation Survey (SEA-MES). With the development of this survey or set of instruments in a very preliminary stage, the early definition is needed of those reports essential to allow the management system to best understand its own operations and to evaluate different approaches which might be tried out in various agencies. The developing SEA-MES concept can be furthered greatly by an approach which defines the specific data needs of the survey(s) as early as possible. This would also contribute to the completeness of the MDAP development, since the MDAP should be as all-inclusive as possible to provide the optimum basis for development and implementation of the data analysis and data processing system necessary to support the over-all JCES efforts.

A procedure was suggested previously in this report for development of detailed report specifications, including both formats and detailed information requirements for the various individual data sheets to be generated to support both management and evaluation functions of the JCES and USOE/State Belmont Organization. It is recommended that the suggested procedure or something aimed at more efficient accomplishment of these same aims be instituted as soon as possible to further this critical developmental requirement.

Required Development of JCES Instrumentation

Several of the proposed JCES instruments remain to be finalized at this time. Actually, the CPIR and the Local Evaluation Handbook (AIR

Guide) are the only newly developed instruments which are complete (excluding here the ELSEGIS and the Universe File). The PCI's for 1970 have undergone extensive revision from the 1969 Compensatory Education Survey instruments and should be finished (final draft) on/about 16 January 1970. Assuming that final review by the Belmont Group does not result in significant requirements for changes, this instrument should be ready for clearance, processing, and later dissemination to schools at approximately the desired time - April 1970.

The Project Descriptor Instrument is still in draft form, but is being further evaluated and is to be refined into a more streamlined instrument if this proves feasible. Contractual development of this instrument is planned for completion during January 1970, and assuming USOE approvals, clearances, etc. should be ready for the planned implementation in the Fall of 1970. Whether further refinement of the end-product of the contractor's effort should be undertaken by the Joint Federal/State Task Force on Evaluation itself, is still in question due to the rather unwieldy aspects of the latest draft instrument reviewed Continuing contractor efforts may well alleviate these problems and result in an instrument practicable for installation as part of the JCES.

The Current Status Measures (CSM) instrument is in a somewhat similar situation to the PDI, in that is still in a rather preliminary draft stage and there are some serious questions regarding its appropriateness for use. The major problem concerns the content of this instrument which appears to contain some serious cultural biases within the item pools prepared for each of the two intended scales. With respect to the contents of both the Basic Verbal scale item pool and that for the Occupational Cognizance scale, one can seriously question the degree to which they are biased toward concepts on which white, native, North Eastern or Western Americans would tend to score consistenly higher than other ethnic or even geographic groups might. The degree of severity of any such biases cannot be easily estimated, but they would appear serious enough to suggest that the proposed 12 - item scales to be built from these item pools would be prone to yield grave differences among large groups which might result from the biases rather than from real differences.

The question of real or apparent differences in CSM scores among groups raises another serious question about these scales: - they are very short, and thus may be expected to have low reliabilities. With instruments of low reliability, dependable conclusions are difficult to come by, even for groups, and of course such instruments should never be the basis for conclusions about individuals.

These questions about the constructs, content and utility of the CSM scales as currently developed should be considered with respect to possible revisions. Whether these scales could be used, as is, in spite of the current inherent difficulties to gather any useful interpretable data is a moot question.

The last instrument, the Program Reference File, is intended to be an expansion of the content of the Universe File collection of data on school activities in Federally funded programs. It was originally intended to substitute for the Universe File questionnaire. This was disallowed within USOE, and the next concept was to apply the additional items to the Belmont State schools population. Whether this is currently to be done or not is still undetermined. The purpose of such additional data collection was to provide program participation data, by schools and by grade level, together with data on the urbanism of the schools, for use in stratification of districts and schools on these factors.

This approach would substitute somewhat more meaningful factors for the currently-used enrollment size of school as a major stratifying factor.

Refinement of Sampling/Research Plans

The research/sampling plan developments for the implementation of all survey instruments require updating or completion at this time, since even those for the PCI's (for April 1970) and the CPIR (Fall 1970) require expansion under the current plans. Furthermore, the development of representative State samples, whether within the Belmont States or Nationwide, might necessitate some slightly different considerations as the bases for sample development. In any case, the existing samples do require augmentation for the purposes of intended applications in the coming months.

Master Data Analysis Plan Development

As indicated earlier in the report, the development of the analysis plans has already been undertaken for some of the individual instruments - notably, the 1969 Survey, which is closely similar to the 1970 PCI. However, even with precise individual instrument analysis plans, the necessity would remain for the interrelation of these plans, and for the development of a master plan for integrated analysis and reports generation. This is a critical remaining requirement, especially in view of the desire to implement a large portion of the total system, including the data processing capabilities within the next year.

Data Processing System Specification, Development and Implementation

This aspect of system implementation was briefly discussed previously, also, and it need only be reiterated here that, regardless of the eventual extent of data processing capability which is settled on to support the JCES, no extensive planning or design work has yet been undertaken. With the widely recognized tendency for data processing system developments to require two to three times as long as predicted, this item is one which should be accelerated.

Considerations Relating to the Management System; Including SEA-MES

Several points related to the developing management chain within the Delivery System and the evaluation of the processes within the chain might be pointed out for additional attention. These include at least the following:

1. The SEA-MES development was mentioned above under the category of reports specification. Obviously, that is not the only aspect of this survey development which requires attention. Since this survey device is in only the embryonic stage, as yet, a full-scale effort is required for development and implementation of the Survey. A major consideration in this development might well be the specification of the reports typifying the processes and activities on-going in State Agencies and the relation of these to the over-all Delivery System management chain. This approach would also clarify the interfaces between the Funding Subsystem and the Substantive Program Subsystem of the total Delivery System. Such clarification would asist the JCES Task Force on Evaluation and the other working groups of the Belmont Organization in further defining the requirements of the SEA-MES. It appears that the SEA-MES might even become involved in assessment of management activities at the district levels, as well as at the State and Federal levels. This statement is based on the large quantity of District to State reports and intercommunications which undoubtedly affect, even dictate, some SEA activities. Over-all evaluation of Program Administration and Grants Management at the State level may well require some limited evaluation of these activites at the local levels as well.

2. A major purpose of the Belmont Working Organization in the joint venture related to establishment of the JCES has been the increased emphasis the JCES might stimulate at the State and local levels on the development of staff members in areas of management and evaluation technologies. This purpose has been undertaken on a limited basis through the CSSO's and other State representatives, and interest appears to have been generated. Capitalizing on this growing interest and the Belmont Organization's Federal/State level could bring about both the planning and implementation of staff development practices within State and local levels in the near future. In fact, an initial step has been taken in this direction with the recent presentation of three one-week institutes on evaluation tools and techniques. These institutes, designed by the Belmont Group Committee on Evaluation Training and Local Evaluation, were presented in August, September and October of 1969. It seems that the successful extension of these concepts depends upon the development of a series of models for the following, which could be applied by the State and Local Agencies for this purpose:

a. Management and/or Evaluation - Staff Development Goals

b. Management Plans - directed at State and local level activities related to the management and administration of the Federal and State funding programs and the maximization of funds utilization to increase the payoffs for the States and local student populations.

c. Management/Evaluation Training Software - materials similar to the Local Evaluation Handbook (AIR Guide) which would allow both individual and group action to improve capabilities relevant to grants management and/or evaluation of both funding programs and substantive projects in schools.

d. The set of items above could lead to the development of a series of USOE/CSSO sponsored Management/Evaluation Training Institutes or Workshops to be delivered at various State and Local Agencies as requested. These could be directed toward specific performance goals or toward generalizable skills and knowledges in these areas.

3. In conjunction with the last item, above, it is suggested that the Joint Federal/State Task Force examine the possibilities for instituting the requirement that the combination of the Project Descriptor Instrument (or an abbreviated version thereof) and the Local Evaluation Hnadbook (AIR Guide) be used in preparation of the Local to State narrative evaluations of Programs and Projects instituted under State Funding management. Similarly, the USOE Bureaus could investigate the potential for ready acceptance of some similar documentation to guide the preparation of the Local reports to USOE related to the evaluation of the Projects developed under the Direct Grants Programs. The utilization of these two instruments in evaluative reporting to upper management would undoubtedly increase the standardization of reporting and thereby increase the effective capability for comparative evaluation of Program and Project activities at both the State and Federal levels.